

TOSHIBA

FILE NO. A03-002F

SERVICE MANUAL/INTEGRATION <OWNER'S MANUAL/INSTALLATION MANUAL>

AIR-CONDITIONER SPLIT TYPE

OUTDOOR UNIT

<SUPER DIGITAL INVERTER>

RAV-SP560AT-E, RAV-SP800AT-E, RAV-SP1100AT-E, RAV-SP1400AT-E

<DIGITAL INVERTER>

RAV-SM560AT-E, RAV-SM800AT-E, RAV-SM1100AT-E, RAV-SM1400AT-E

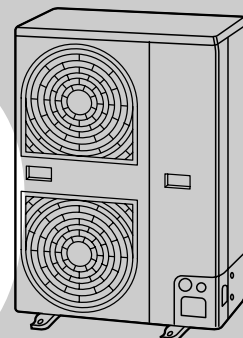
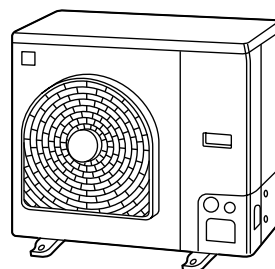
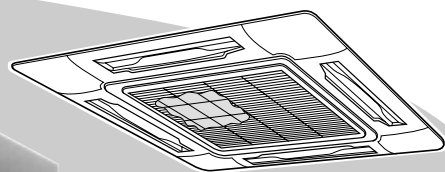
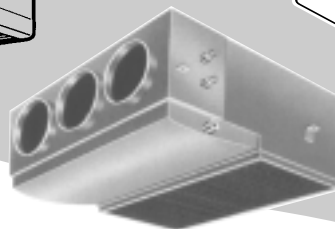
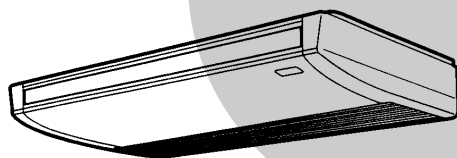
INDOOR UNIT

<SUPER DIGITAL INVERTER>

RAV-SP1100UT-E

<DIGITAL INVERTER>

*RAV-SM560UT-E, RAV-SM560BT-E, RAV-SM561BT-E, RAV-SM561CT-E,
RAV-SM800UT-E, RAV-SM800BT-E, RAV-SM801BT-E, RAV-SM801CT-E,
RAV-SM1100UT-E, RAV-SM1101CT-E, RAV-SM1101BT-E,
RAV-SM1400UT-E, RAV-SM1401CT-E, RAV-SM1401BT-E*



ADOPTION OF NEW REFRIGERANT

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

WARNING

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself. The cleaning diagram for the air filter is there for the service person, and not for the customer.

Service Manual Table
FILE NO. for Owner's Manual / Service Manual

RAV- name	Type	Indoor unit				Outdoor unit	
		UT-E	BT-E		CT-E **1CT-E	AT-E	SP ***AT-E
			AC motor **0BT-E	DC motor **1BT-E			
SM560	O/M S/M	A02-013 A02-014	A02-013 A02-014	A03-006 A03-007	A03-015 A03-016	A02-013 A02-014	A03-013 A03-014
SM800	O/M S/M	A02-013 A02-014	A02-013 A02-014	A03-006 A03-007	A03-015 A03-016	A02-013 A02-014	A03-013 A03-014
SM1100	O/M S/M	A03-002 A03-003	—	A03-006 A03-007	A03-015 A03-016	A03-002 A03-003	A03-013 A03-014
SM1400	O/M S/M	A03-002 A03-003	—	A03-006 A03-007	A03-015 A03-016	A03-002 A03-003	A03-013 A03-014
SP1100	O/M S/M	A03-013 A03-014	—	—	—	—	A03-013 A03-014

* O/M : OWNER'S MANUAL, INSTALLATION MANUAL

* S/M : SERVICE MANUAL

NOTICE

Concerning models for **RAV-SM **** KRT-E**, and **RAV-SM **** XT-E**, please contact the following address ;

Toshiba Carrier (Thailand) Co., Ltd.
144/9 Moo 5, BangKadi Industrial park,
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Fax : +66-2-501-1130

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4-Way Air Discharge Cassette Type

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Concealed Duct Type

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Under Ceiling Type

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4-Way Air Discharge Cassette Type

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RAV-SM560AT-E, RAV-SM800AT-E

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RAV-SM1100AT-E, RAV-SM1400AT-E

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1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION

New Refrigerant Air Conditioner Installation

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.


Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION

To Disconnect the Appliance from Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (25A D type ) must be used for the power supply line of this conditioner.



WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
Do not store it in a wet basement or expose to rain or water.
- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
Inappropriate installation may result in water leakage, electric shock or fire.

- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Be sure to provide grounding.**
Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.
- **Conform to the regulations of the local electric company when wiring the power supply.**
Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
If a combustible gas leaks, and stays around the unit, a fire may occur.

Required tools for installation work

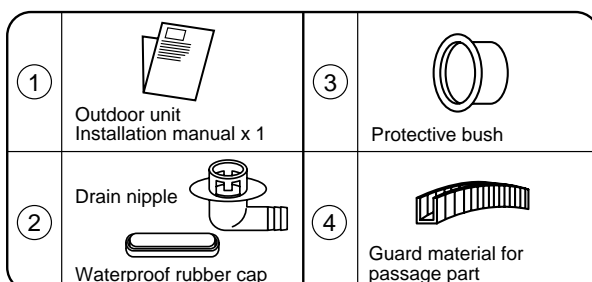
- | | |
|----------------------------|----------------------------|
| 1) Philips screw driver | 10) Mega-tester |
| 2) Hole core drill (65 mm) | 11) Electro circuit tester |
| 3) Spanner | 12) Hexagonal wrench |
| 4) Pipe cutter | 13) Flare tool |
| 5) Knife | 14) Pipe bender |
| 6) Reamer | 15) Level vial |
| 7) Gas leak detector | 16) Metal saw |
| 8) Tape measure | |
| 9) Thermometer | |

R410A (Special requirement)

- 17) Gauge manifold
(Charge hose : R410A special requirement)
- 18) Vacuum pump
(Charge hose : R410A special requirement)
- 19) Torque wrench
1/4 (17 mm) 16 N•m (1.6 kgf•m)
3/8 (22 mm) 42 N•m (4.2 kgf•m)
1/2 (26 mm) 55 N•m (5.5 kgf•m)
5/8 (15.9 mm) 120 N•m (12.0 kgf•m)
- 20) Copper pipe gauge adjusting projection margin
- 21) Vacuum pump adapter

2 ACCESSORY AND REFRIGERANT

Accessory and Installation Parts



Refrigerant Piping

- Piping kit used for the conventional refrigerant cannot be used.
- Use copper pipe with 0.8 mm or more thickness for Ø9.5.
Use copper pipe with 1.0 mm or more thickness for Ø15.9.
- Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

3 SELECTION OF INSTALLATION

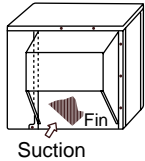
CAUTION

<SP1100AT-E, SP1400AT-E only>

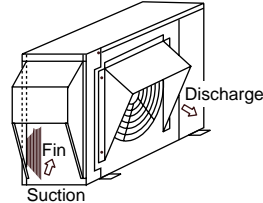
When using an air conditioner under low outside temperature condition (Outside temp.: -5°C or lower) with COOL mode, prepare a duct or wind shield so that it is not affected by the wind.

<Example>

Suction hood (Rear side)

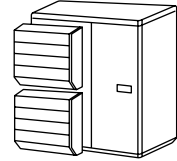
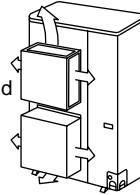


Suction hood (Side)
Discharge hood



(Discharge upward/downward
or leftward is also available.)

Use it at location
where a side wind
drives thickly



Before installation

Be careful to the following items before installation.

Length of refrigerant pipe

<SM1100AT-E, SM1400AT-E>

Length of refrigerant pipe connected to indoor/outdoor unit	Item
20m or shorter	Addition of refrigerant is unnecessary at the local site.
*21m to 50m	<Addition of refrigerant> Add 40g of refrigerant for every 1m of pipe which exceeds 20m.

* Caution at addition of refrigerant

When the total length of refrigerant pipe exceeds 20m, add 40g/m of refrigerant and the maximum total length of pipe is 50m.
(Max. amount of additional refrigerant is 1200g.)

Charge the refrigerant accurately. Overcharge may cause a serious trouble of compressor.

<SP1100AT-E, SP1400AT-E>

Length of refrigerant pipe connected to indoor/outdoor unit	Item
30m or shorter	Addition of refrigerant is unnecessary at the local site.
*31m to 70m	<Addition of refrigerant> Add 40g of refrigerant for every 1m of pipe which exceeds 30m.

* Caution at addition of refrigerant

When the total length of refrigerant pipe exceeds 30m, add 40g/m of refrigerant and the maximum total length of pipe is 70m.
(Max. amount of additional refrigerant is 1600g.)

Charge the refrigerant accurately. Overcharge may cause a serious trouble of compressor.

Air purge

- For air purge, use a vacuum pump.
- Do not use refrigerant charged in the outdoor unit for air purge. (The refrigerant for air purge is not contained in the outdoor unit.)

Electrical cabling

- Be sure to fix the power cables and indoor/outdoor connecting cables with clamps so that they do not contact with the cabinet, etc.

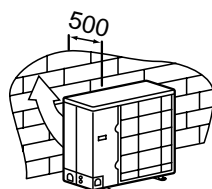
Installation Place

- A place which provides a specified space around the outdoor unit.
- A place where the operation noise and discharged air are not given to your neighbors.
- A place that is not exposed to a strong wind.
- A place that does not block a passage.
- When the outdoor unit is installed in an elevated position, be sure to secure its feet.
- There must be sufficient space for carrying in the unit.
- A place where the drain water does not make any problem.

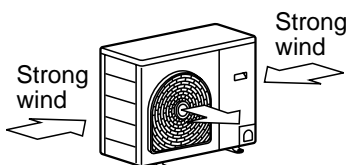
CAUTION

1. Install the outdoor unit at a place where discharge air is not blocked.
2. When an outdoor unit is installed in a place that is always exposed to a strong wind like a coast or on a high storey of a building, secure a normal fan operation by using a duct or a wind shield.
3. When installing the outdoor unit in a place that is constantly exposed to a strong wind such as the upper stairs or rooftop of a building, apply the windproof measures referring to the following examples.

- 1) Install the unit so that its discharge port faces to the wall of the building. Keep a distance 500 mm or more between the unit and the wall surface.



- 2) Supposing the wind direction during the operation season of the air conditioner, install the unit so that the discharge port is set at right angle to the wind direction.



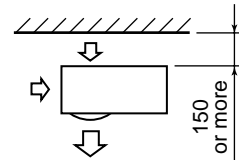
4. Installation in the following places may result in some troubles. Do not install the unit in such places below.
 - A place full of machine oil.
 - A place full of sulphuric gas.
 - A place where high-frequency radio waves are likely to be generated as from audio equipment, welders, and medical equipment.

Necessary Space for Installation

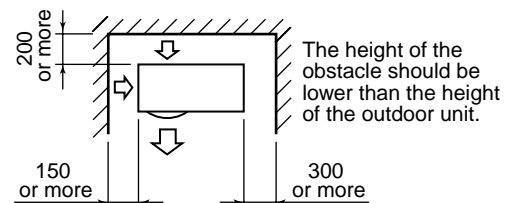
Obstacle at rear side

<Upper side is free>

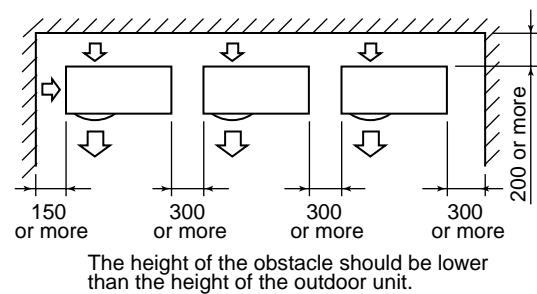
1. Single unit installation



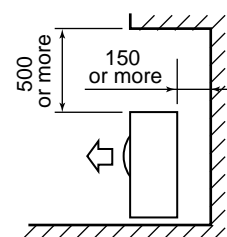
2. Obstacles at both right and left sides.



3. Serial installation of two or more units



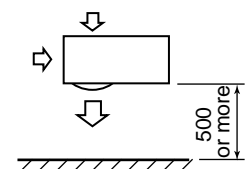
<Obstacle also at the upper side>



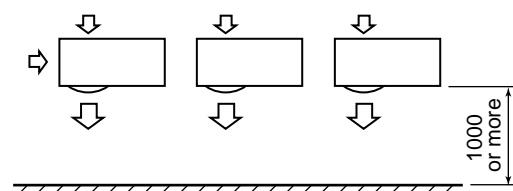
Obstacle at front side

<Upper side is free>

1. Single unit installation

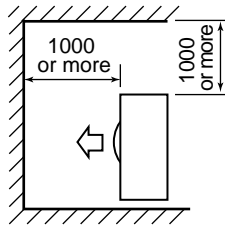


2. Serial installation of two or more units



3 SELECTION OF INSTALLATION

<Obstacle also at the upper side>

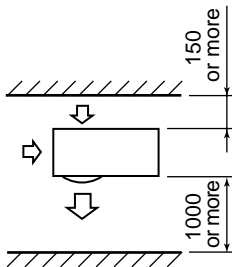


Obstacles at both front and rear sides

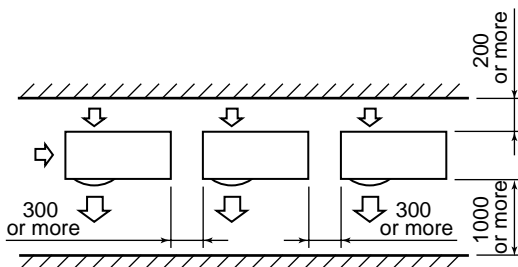
Open the upper side and both right and left sides. The height of obstacle at both front and rear side, should be lower than the height of the outdoor unit.

<Standard installation>

1. Single unit installation



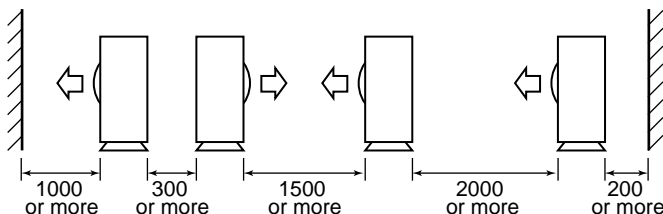
2. Serial installation of two or more units



Serial installation at front and rear sides

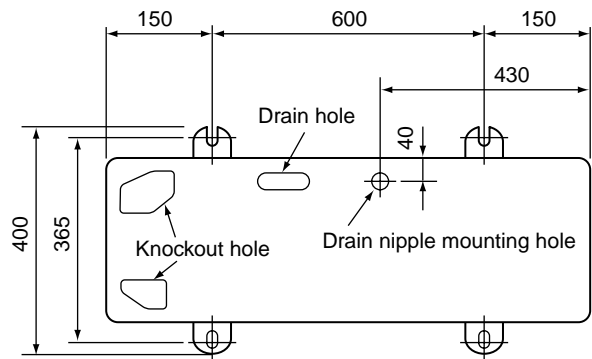
Open the upper side and both right and left sides. The height of obstacle at both front and rear sides should be lower than the height of the outdoor unit.

<Standard installation>

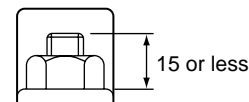


Installation of Outdoor Unit

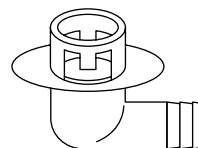
- Before installation, check strength and horizontality of the base so that abnormal sound does not generate.
- According to the following base diagram, fix the base firmly with the anchor bolts.
(Anchor bolt, nut: M10 x 4 pairs)



Set the out margin of the anchor bolt to 15mm or less.



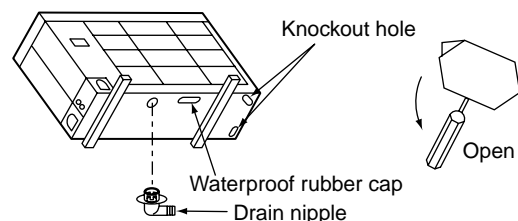
- In case of draining through the drain hose, attach the following drain nipple and the waterproof rubber cap, and use the drain hose (Inner diam.: 16mm) sold on the market. And also seal the screws securely with silicone material, etc. so that water does not drop down. Some conditions may cause dewing or dripping of water.



Drain nipple



Waterproof rubber cap



- When there is a possibility of freezing of drain at the cold district or a snowfall area, be careful for drainage ability of drain. The drainage ability increases when a knockout hole on the base plate is opened. (Open the knockout hole to outside using a screwdriver, etc.)

Optional Installation Parts (Local Procure)

	Parts name	Q'ty
A	Refrigerant piping Liquid side : Ø9.5 mm Gas side : Ø15.9 mm	Each one
B	Pipe insulating material (polyethylene foam, 6 mm thick)	1
C	Putty, PVC tapes	Each one

Refrigerant Piping Connection

CAUTION

TAKE NOTICE THESE IMPORTANT 4 POINTS BELOW FOR PIPING WORK

1. Keep dust and moisture away from inside the connecting pipes.
2. Tightly connect the connection between pipes and the unit.
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check gas leak at connected points.

<Piping connection>

Liquid side		Gas side	
Outer diameter	Thickness	Outer diameter	Thickness
Ø9.5	0.8	Ø15.9	1.0

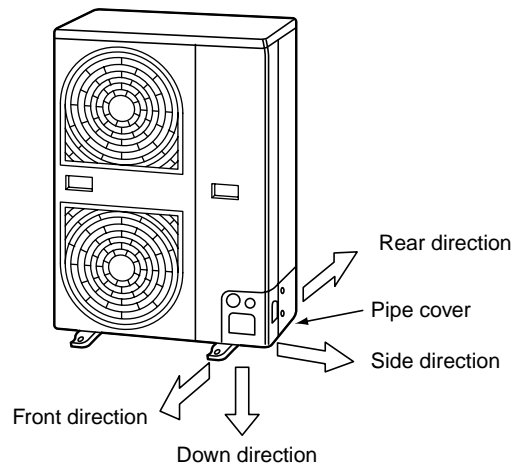
For Reference

If a heating operation would be continuously performed for a long time under the condition that the outdoor temperature is 0°C or lower, draining of defrosted water may be difficult due to freezing of the bottom plate, resulting in a trouble of the cabinet or fan.

It is recommended to procure an anti-freeze heater locally for a safety installation of the air conditioner.

For details, contact the dealer.

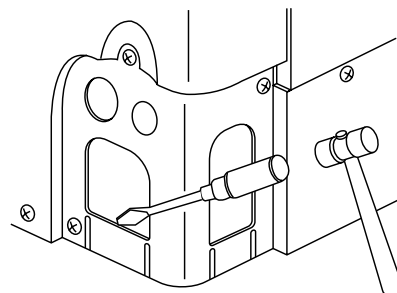
Knockout of Pipe Cover



Knockout procedure

- The indoor/outdoor connecting pipes can be connected to 4 directions.
Take off the knockout part of the pipe cover in which pipes or wires pass through the base plate.
- As shown in the figure, do not remove the pipe cover from the cabinet so that the knockout hole can be easily punched. To knock out, it is easily taken off by hands by punching a position at the lower side of 3 connected parts with screwdriver along the guide line.
- After marking the knockout hole, remove the burr and mount the attached protective bush and guard material for pass-through part in order to protect pipes and wires.

After connecting the pipes, be sure to mount the pipe cover. The pipe cover is easily mounted by cutting off the slit at the lower part of the pipe cover.



3 SELECTION OF INSTALLATION

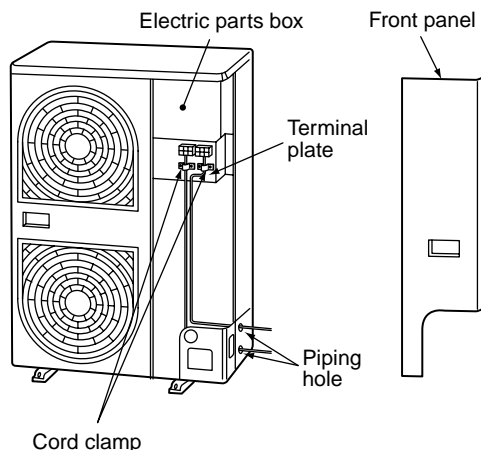
How to remove the front panel

1. Remove screws of the front panel.
2. Pull the front panel downward.

Removing the front panel, the electric parts appear at the front side.

- The metal pipes are attachable to the piping holes. If the size of the used power pipe does not match with the hole, adjust the hole size to match with pipe size.
- Be sure to fix the power cable and indoor/outdoor connecting cable with bundling band sold on the market so that they do not make contact with the compressor and discharge pipe. (Temperature of the compressor and discharge pipe becomes high.)

In order to avoid the force applied to on the connecting section, be sure to fix the cables to the cord clamps provided on the pipe valve fixing plate and the electric parts box.

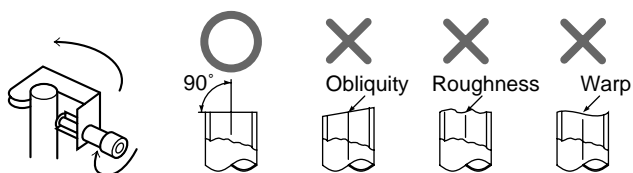


4 REFRIGERANT PIPING

Pipe Forming/End Positioning

Flaring

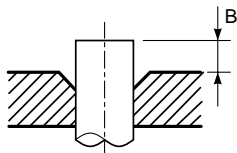
1. Cut the pipe with a pipe cutter.



2. Insert a flare nut into the pipe, and flare the pipe.

As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

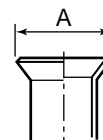
However, the conventional tools can be used by adjusting projection margin of the copper pipe.



• Flaring size : A (Unit : mm)

Outer dia. of copper pipe	A ⁺⁰ / _{-0.4}	
	R410A	R22
6.4	9.1	9.0
9.5	13.2	13.0
12.7	16.6	16.2
15.9	19.7	19.4

* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that of R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.



• Projection margin in flaring : B (Unit : mm)

Rigid (Clutch type)

Outer dia. of copper pipe	R410A tool used		Conventional tool used	
	R410A	R22	R410A	R22
6.4	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
9.5	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
12.7	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
15.9	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0

Imperial (Wing nut type)

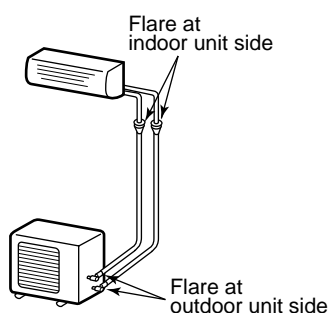
Outer dia. of copper pipe	R410A	R22
6.4	1.5 to 2.0	1.0 to 1.5
9.5	1.5 to 2.0	1.0 to 1.5
12.7	2.0 to 2.5	1.5 to 2.0
15.9	2.0 to 2.5	1.5 to 2.0

4 REFRIGERANT PIPING

Tightening of Connecting Part

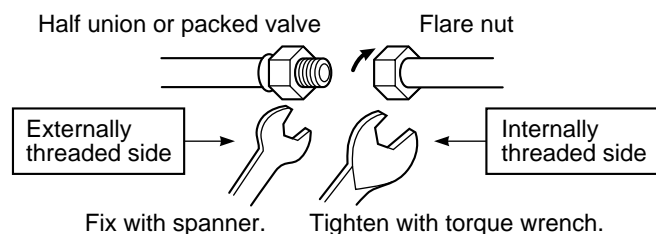
(Unit: N•m)

Outer dia. of copper pipe	Tightening torque
6.4 mm (diam.)	14 to 18 (1.4 to 1.8 kgf•m)
9.5 mm (diam.)	33 to 42 (3.3 to 4.2 kgf•m)
12.7 mm (diam.)	50 to 62 (5.0 to 6.2 kgf•m)
15.9 mm (diam.)	68 to 82 (6.8 to 8.2 kgf•m)



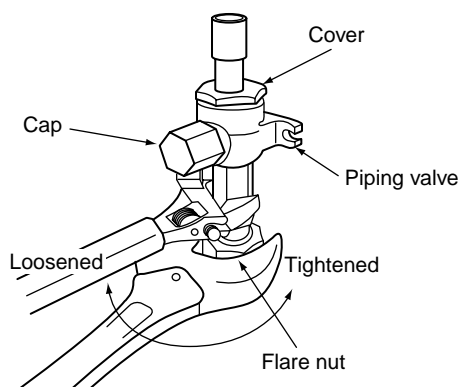
- Align the centers of the connecting pipes and tighten the flare nut strong as far as possible with your fingers.

Then fix the nut with a spanner and tighten it with torque wrench as shown in the figure.



- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.

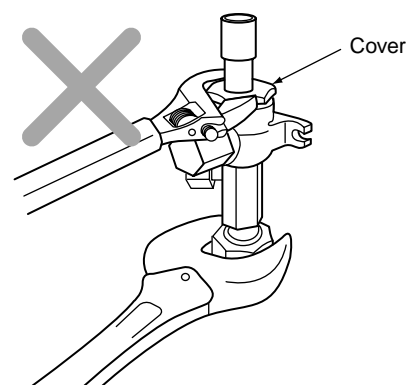
On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.



Valve at gas side

REQUIREMENT

- Do not put the spanner on the cap. The valve may be broken.
 - If applying excessive torque, the nut may be broken according to some installation conditions.
- After the installation work, be sure to check gas leak of connecting part of the pipes with nitrogen.



- Pressure of R410A is higher than that of R22 (Approx. 1.6 times). Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor/outdoor units at the specified tightening torque. Incomplete connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.

Do not apply refrigerating machine oil to the flared surface.

5 EVACUATING

Air Purge

This air conditioner can be installed up to the connecting pipe length and height difference in the following table.

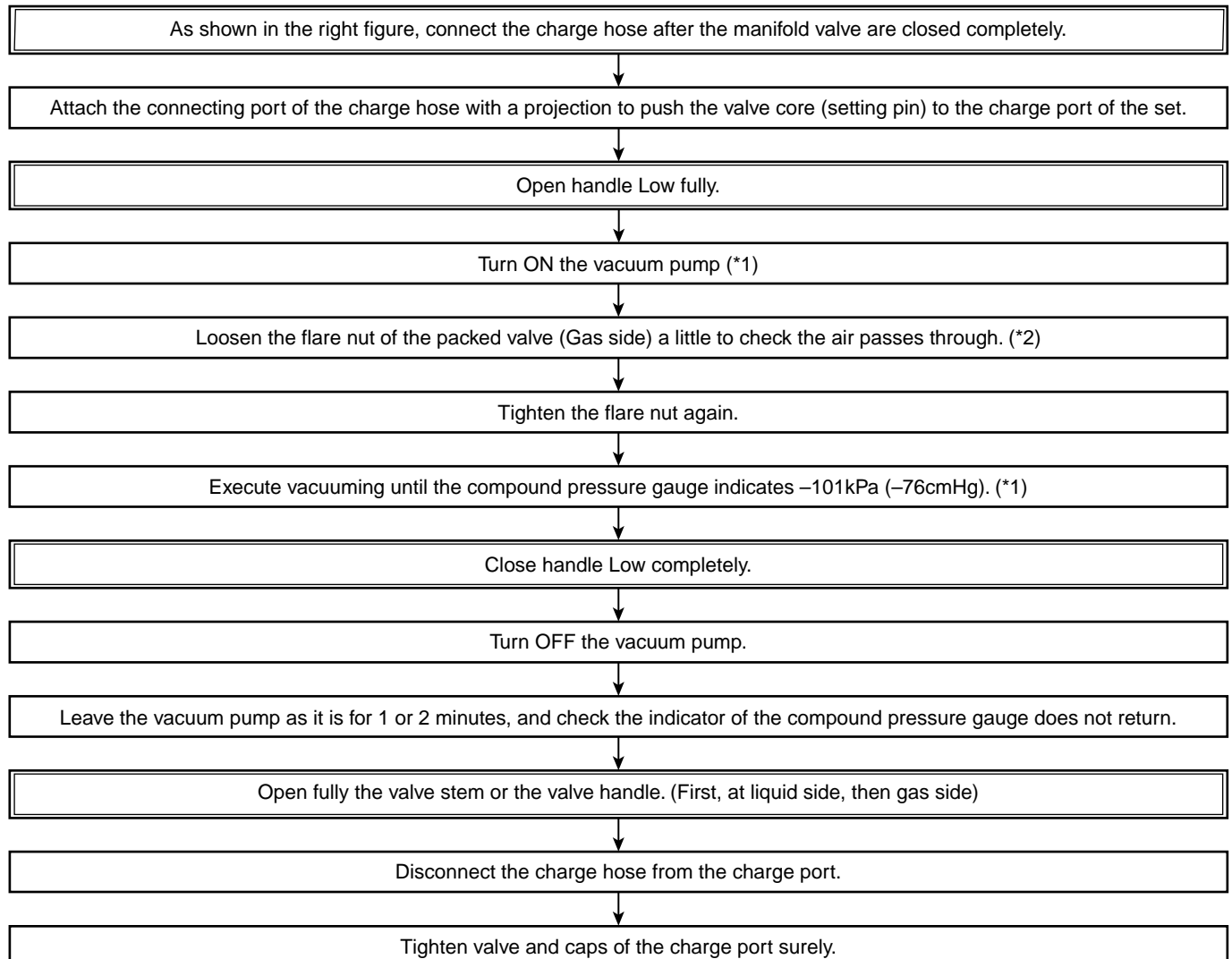
Capacity rank	Max. connecting pipe length (m)	Height difference (m)		Hexagonal wrench size
		Outdoor unit at upper side	Outdoor unit at lower side	
SM1100, SM1400 type	50	30	15	4mm
SP1100, SP1400 type	70	30	15	

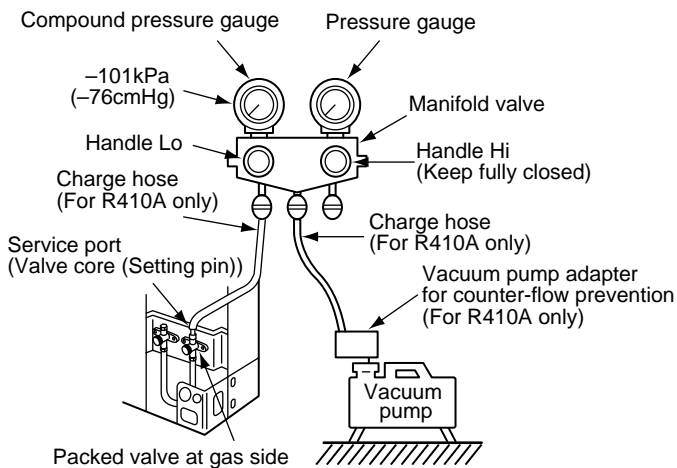
With respect to the preservation of terrestrial environment, adopt "Vacuum pump" for air purge (Evacuate air in the connecting pipes) when installing the unit.

- Do not discharge the refrigerant gas to the atmosphere to preserve the terrestrial environment.
- Use a vacuum pump to discharge the air (nitrogen, etc.) remained in the set. If the air remains, the capacity may decrease.

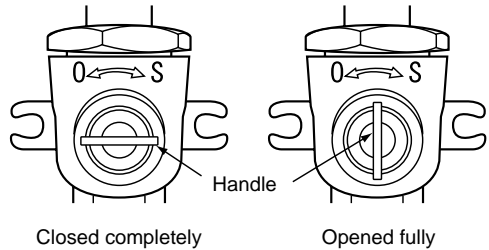
For the vacuum pump, be sure to use one with backflow preventer so that the oil in the pump does not backflow into the pipe of the air conditioner when the pump stops. (If oil in the vacuum pump is put in an air conditioner including R410A, it may cause trouble on the refrigeration cycle.)

Vacuum pump

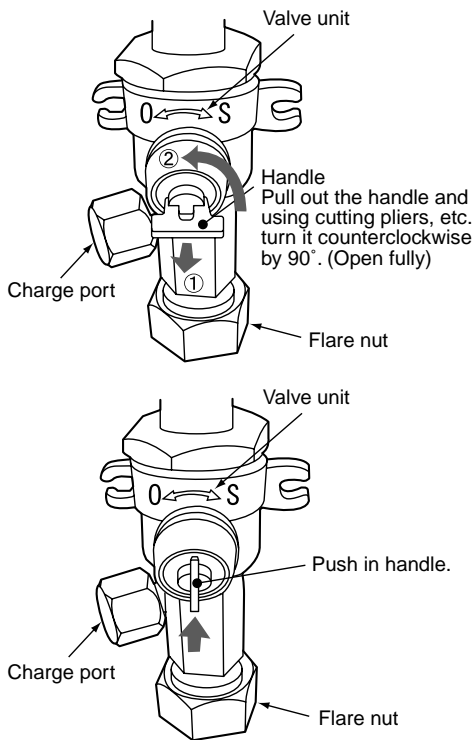




Handle position



How to open the valve



- *1. Use the vacuum pump, vacuum pump adapters, and gauge manifold referring to the manuals attached to each tool before using them. For the vacuum pump, check oil is filled up to the specified line of the oil gauge.
- *2. While the air is purged, check again that the connecting port of charge hose, which has a projection to push the valve core, is firmly connected to the charge port.


Valve handling precautions

- Open the valve stem or the handle until it strikes the stopper. It is unnecessary to apply further force.
- Securely tighten the cap with a torque wrench.
- Cap tightening torque

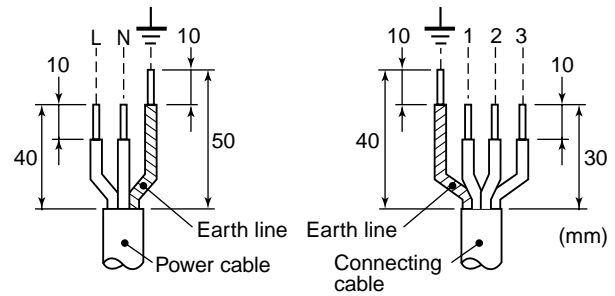
Valve size	Ø6.4	14 to 18N•m (1.4 to 1.8kgf•m)
	Ø9.5	33 to 42N•m (3.3 to 4.2kgf•m)
	Ø12.7	33 to 42N•m (3.3 to 4.2kgf•m)
	Ø15.9	20 to 25N•m (2.0 to 2.5kgf•m)
Charge port		14 to 18N•m (1.4 to 1.8kgf•m)

6 ELECTRICAL WORK

For the air conditioner that has no power cable, connect a power cable as mentioned below.

Model RAV-	SM1100AT-E	SM1400AT-E SP1100AT-E SP1400AT-E
Power supply	220 – 240 V Single phase 50 Hz	
Maximum running current	22.0 A	22.8 A
Installation fuse rating	25 A (D type )	
Power cable	H07 RN-F or 245 IEC 66 (2.5 mm ² or more)	


Stripping length power cord and connecting cable



CAUTION

- Wrong wiring may cause a burn-out to some electrical parts.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations of the cable from outdoor unit to indoor unit. (wire size and cabling method etc.)
- Use the power and Inter-connecting cables with specified thickness, specified type and protective devices required.

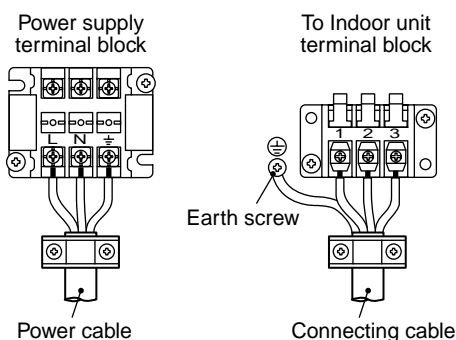
CAUTION

- The installation fuse (25A D type ) must be used for the power supply line of this air conditioner.
- Incorrect/incomplete wiring might cause an electrical fire or smoke.
- Prepare the exclusive power supply for the air conditioner.
- This product can be connected to the mains.
Connection to the fixed wiring :
A switch which disconnects all poles and has a contact separation of at least 3 mm must be incorporated in the fixed wiring.

How to wire

1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit.
H07 RN-F or 245 IEC 66 (1.0 mm² or more)
2. When connecting the connecting cable to the outdoor unit terminal, prevent water coming in the outdoor unit.
3. Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
4. For inter connecting cable, do not use a wire jointed to another on the way.

Use wires long enough to cover the entire length.



7 FINAL INSTALLATION CHECKS

Check and Test Operation

For R410A, use the leak detector exclusively manufactured for HFC refrigerant (R410A, R134a, etc.).

- * The conventional leak detector for HCFC refrigerant (R22, etc.) cannot be used because its sensitivity for HFC refrigerant lowers to approx. 1/40.
- Pressure of R410A is approx. 1.6 times higher than that of R22.
If installation work is incompletely finished, a gas leakage may occur when pressure rises during operation. Therefore, be sure to test the piping connections for leakage.
- Check gas leakage at the flare nut connections, valve stem cap connections and service port cap fittings with a leak detector or soap water.

CAUTION

When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on.

It is not a trouble, but is because the setup of the remote controller is being checked.

For the second power-ON time and after, approx. 1 minute is required to start the operation by the remote controller.

Useful Functions

Self-Diagnosis by LED Indication

In addition to the code checking by remote controller of the indoor unit, troubles of the outdoor unit can be diagnosed by LED indications on the cycle control P.C. board of the outdoor unit. Utilize them for various checks. For the check by remote controller of the indoor unit, refer to the Installation Manual of the indoor unit. Before a check, confirm each bit of the DIP switch SW800 is set to OFF position.

LED indication and code checking

LED indication	Cycle control P.C. board				Cause
	LED indication				
	D800	D801	D802	D803	
D800 ○ : Red D801 ○ : Yellow D802 ○ : Yellow D803 ○ : Yellow ◎ : Rapid flash ● : Go off ○ : Go on	○	●	●	●	Heat exchanger sensor (TE) error
	●	●	○	●	Suction sensor (TS) error
	○	○	●	●	Discharge sensor (TD) error
	●	○	●	○	High-pressure protection error
	●	○	●	●	Outdoor temperature sensor (TO) error
	○	○	○	●	DC outside fan error
	○	●	●	○	Communication error between IPDU (Abnormal stop)
	●	○	●	○	High-pressure release operation
	●	○	○	●	Discharge temp. error
	○	○	●	○	EEPROM error
	●	●	○	○	Communication error between IPDU (No abnormal stop)
	◎	●	●	●	G-Tr short-circuit protection
	●	◎	●	●	Detect circuit error
	◎	◎	●	●	Current sensor error
	●	●	◎	●	Comp. lock error
	◎	●	◎	●	Comp. break down

7 FINAL INSTALLATION CHECKS








Installation/Service Tools

Changes in the product and components

In the case of an air conditioner using R410A, in order to prevent any other refrigerant from being charged accidentally, service port diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping flare processing diameter and size of opposite side of flare nuts has been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

New tools for R410A

New tools for R410A	Applicable to R22 model	Changes
Gauge manifold	×	 As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter is changed.
Charge hose	×	 In order to increase pressure resisting strength, hose materials and port size are changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to check the port size.
Electronic balance for refrigerant charging	○	 As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal diam. 1/2, 5/8)	×	 The size of opposite sides of flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)	○	 By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved.
Gauge for projection adjustment	—	— Used when flare is made with using conventional flare tool.
Vacuum pump adapter	○	 Connected to the conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports-one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector	×	 Exclusive for HFC refrigerant.

- Incidentally, the “refrigerant cylinder” comes with the refrigerant designation (R410A) and protector coating in the U.S.'s ARI specified rose color (ARI color code: PMS 507).
- Also, the “charge port and packing for refrigerant cylinder” require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

INDOOR

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INSTALLATION MANUAL

4-Way Air Discharge Cassette Type

RAV-SP1100UT-E

RAV-SM560UT-E, RAV-SM800UT-E, RAV-SM1100UT-E, RAV-SM1400UT-E

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Concealed Duct Type

RAV-SM560BT-E, RAV-SM800BT-E,

RAV-SM561BT-E, RAV-SM801BT-E, RAV-SM1101BT-E, RAV-SM1401BT-E

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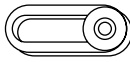
Under Ceiling Type


RAV-SM561CT-E, RAV-SM801CT-E, RAV-SM1101CT-E, RAV-SM1401CT-E

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Accessory parts and Parts to be procured locally

☐ Accessory parts

Part name		Q'ty	Shape
Pipe insulator		2	
Clamp for air filter fixing	561BT	2	
	801BT 1101BT 1401BT	4	
Washer for unit hung-up		8	

Part name		Q'ty	Shape
Clamp screw	561BT	2	
	801BT 1101BT 1401BT	4	
Connecting cable for High static pressure tap			(with pedestal)
Installation Manual		1	
Owner's Manual		1	

<Separate sold parts>

Part name	Q'ty	Shape
Standard wired remote controller	1	

☐ Parts to be procured locally

<p>Connecting pipe (Liquid side) (6.4mm (diam.), Nominal (diam.) 1/4" thick 0.8mm) RAV-SM561BT, RAV-SM560AT</p> <p>(9.52mm (diam.), Nominal (diam.) 3/8" thick 0.8mm) RAV-SM801BT, RAV-SM800AT RAV-SM1101BT, RAV-SM1100AT RAV-SM1401BT, RAV-SM1400AT</p>
<p>Connecting pipe (Gas side) (12.7mm (diam.), Nominal (diam.) 1/2" thick 0.8mm) RAV-SM561BT, RAV-SM560AT</p> <p>(15.9mm (diam.), Nominal (diam.) 5/8" thick 1.0mm) RAV-SM801BT, RAV-SM800AT RAV-SM1101BT, RAV-SM1100AT RAV-SM1401BT, RAV-SM1400AT</p>
<p>Power supply cord 2.5mm² (H07RN-F or 245IEC66) (20m or less), 3.5mm² (AWG-12) (50m or less)</p>

<p>Connecting cable H07RN-F or 245IEC66 (1.5mm² or more)</p>
<p>Thermal insulation for refrigerant pipe (10mm or more, thermal insulating foam polyethylene)</p>
<p>Thermal insulation for drain pipe (10mm or more, foam polyethylene)</p>
<p>Drain pipe (Outer 32mm (diam.)) (VP25)</p>
<p>Tapes</p>
<p>Grounding cable (2.0mm (diam.) or more)</p>

1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION

New Refrigerant Air Conditioner Installation

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION

To Disconnect the Appliance from Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (25A D type ) must be used for the power supply line of this conditioner.



WARNINGS

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**

Inappropriate installation may result in water leakage, electric shock or fire.

- **Turn off the main power supply switch or breaker before attempting any electrical work.**

Make sure all power switches are off. Failure to do so may cause electric shock.

- **Connect the connecting cable correctly.**

If the connecting cable is connected in a wrong way, electric parts may be damaged.

- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**

If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.

- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**

- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**

Do not store it in a wet basement or expose to rain or water.

- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
If a combustible gas leaks, and stays around the unit, a fire may occur.

2 SELECTION OF INSTALLATION PLACE

⚠ WARNING

- **Install the air conditioner at enough strong place to withstand the weight of the unit.**
If the strength is not enough, the unit may fall down resulting in injury.
- **Install the air conditioner at a height 2.5m or more from the floor.**
If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

⚠ CAUTION

- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
If a combustible gas leaks and stays around the unit, a fire may occur.

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

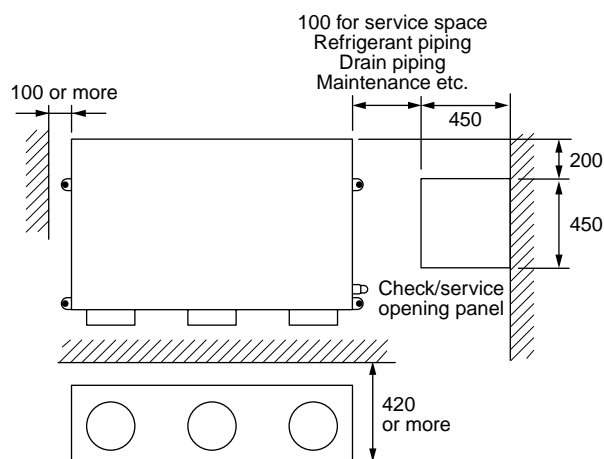
- Place where the unit can be installed horizontally.
- In the process after removing the ceiling panel, it important to reinforce the groundwork (framework) and keep a level correctly of the existing ceiling to prevent vibration of the ceiling panel.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
(When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)

Installation space

Secure the space required to installation and servicing.



Selection of installation place

In case of continued operation of the indoor unit under high-humidity conditions as described below, dew may condense and water may drop.

Especially, high-humidity atmosphere (dew point temperature : 23°C or more) may generate dew inside the ceiling.

1. Unit is installed inside the ceiling with slated roof.
2. Unit is installed at a location using inside of the ceiling as fresh air take-in path.
3. Kitchen

If installing a unit at such place, adhere insulating material (glass wool, etc.) additionally over all the positions of the indoor unit which come to contact with high-humidity atmosphere.

Advice

Set a check service opening panel at right side of the unit (size: 450 x 450mm) for piping, maintenance, and servicing.

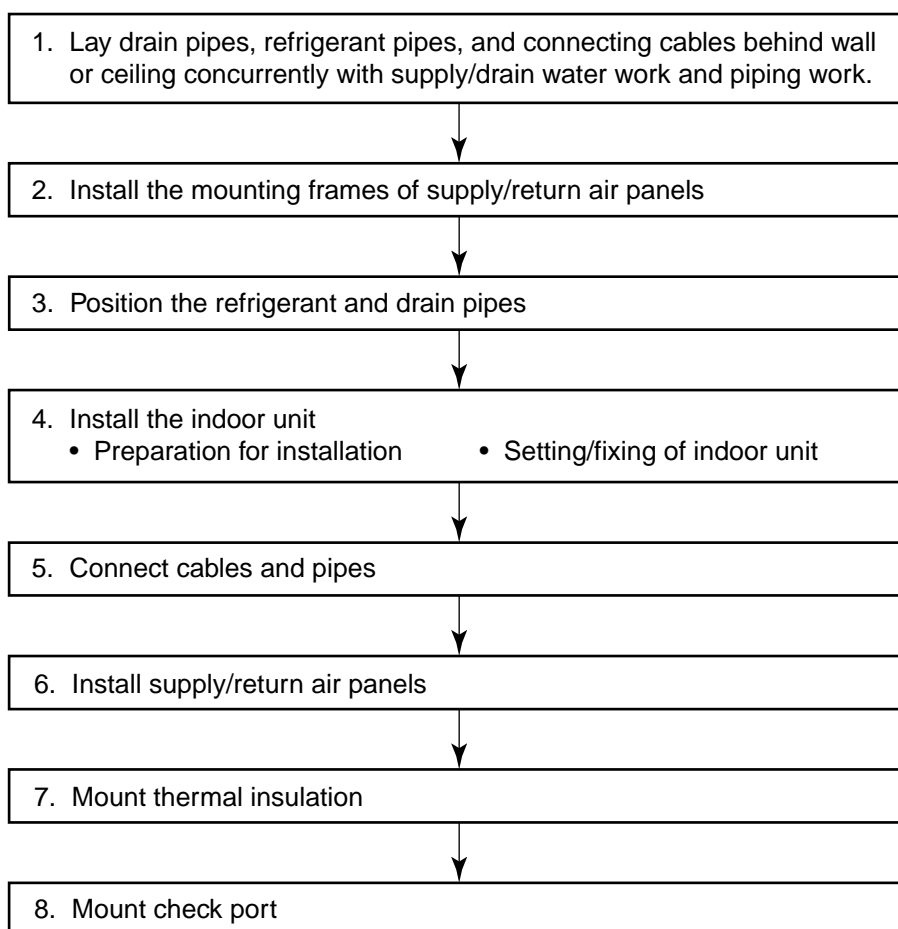
3 INSTALLATION OF INDOOR UNIT



WARNING

Install the air conditioner certainly at a place to sufficiently withstand the weight.
If the strength is insufficient, the unit may fall down resulting in human injury.
Perform a specified installation work to guard against an earthquake.
An incomplete installation can cause accidents by the units falling and dropping.

Installation procedure

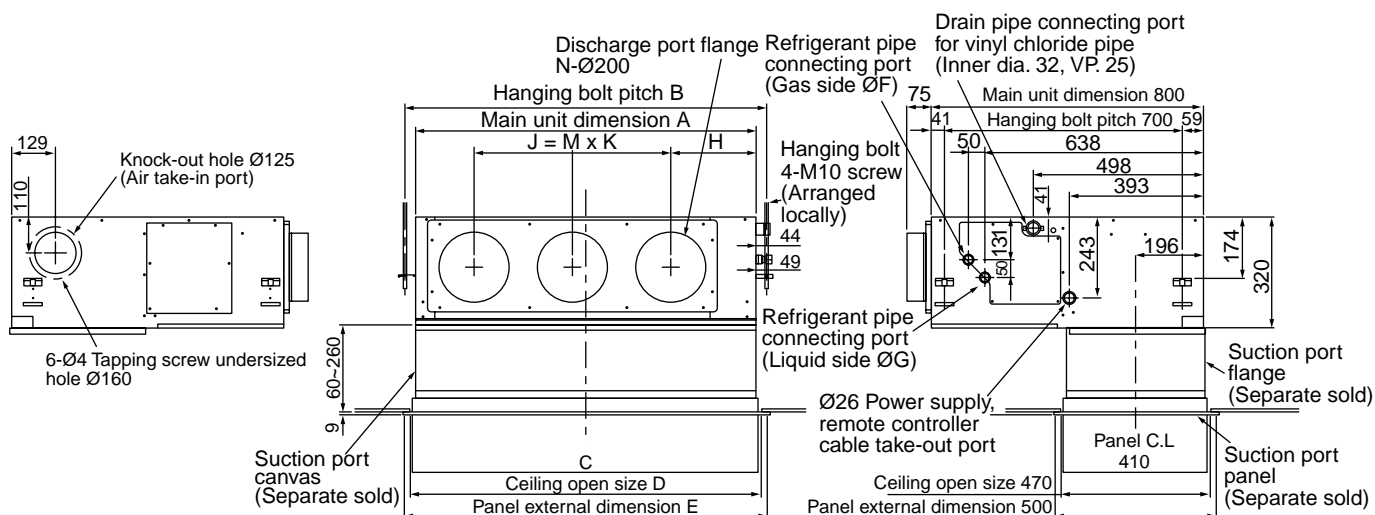


3 INSTALLATION OF INDOOR UNIT

External view

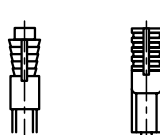
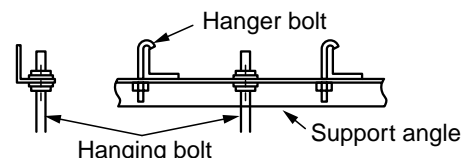
REQUIREMENT

The hanging bolt pitch on horizontal direction (B) is not halved at center with the ceiling opening size. Therefore, check the relational position in the following figure.



• Dimension

	A	B	C	D	E	F	G	H	J	K	M	N
RAV-SM561BT	700	766	690	750	780	12.7	6.4	252	280	280	1	2
RAV-SM801BT	1000	1066	990	1050	1080	15.9	9.5	252	580	290	2	3
RAV-SM1101, 1401BT	1350	1416	1340	1400	1430	15.9	9.5	252	930	310	2	4

In case of concrete slab	In case of steel structure
<p>A hole-in-anchor, a hole-in-plug, or a hole-in-bolt is used.</p> 	<p>Angle is used as it is, or a support angle is newly set.</p> 

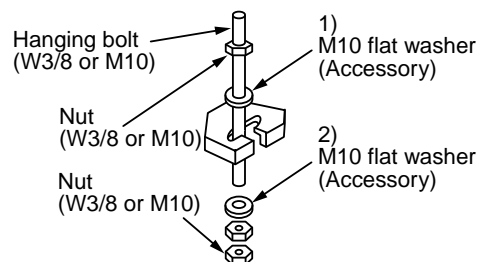
1. Hanging down of indoor unit

Refer to installation figures of hanging material and hanging bolt.

- Adjustment of hanging bolt length and nut position

Adjust hanging bolt length and nut position as shown in the figure before hanging down the indoor unit.

- Using the level vial, etc., set the horizontal level of the main unit within 5mm.



- 1) Required those other than M10 flat washer at site.
- 2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure.

Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.

- If the ceiling has been already set, prepare refrigerant pipe, drain pipe, connecting wire, switch panel cord, etc. at the place where pipe and wire are connected before hanging the main unit.

Installation of remote controller (Sold separately)

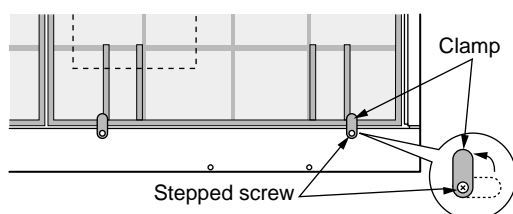
For installation of a remote controller, follow the Installation Manual attached to the remote controller.

- Do not install the remote controller at a place exposed to direct sunlight or near the stove.
- Install a remote controller after operating it and confirming that the indoor unit surely receives a signal.
[Wireless type]
- Install a remote controller apart from the TV or stereo device, otherwise image disturbance or noise may generate.
[Wireless type]

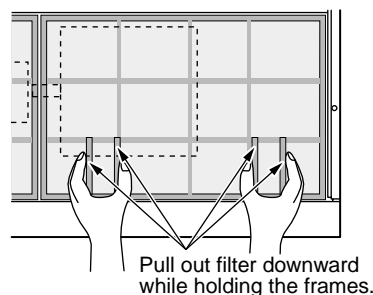
Mounting of clamp (Accessory)

In order to avoid falling of the air filter, be sure to mount the attached clamps with stepped screws.
(561BT : 2, 801BT to 1401BT : 4)

• Clamp mounting

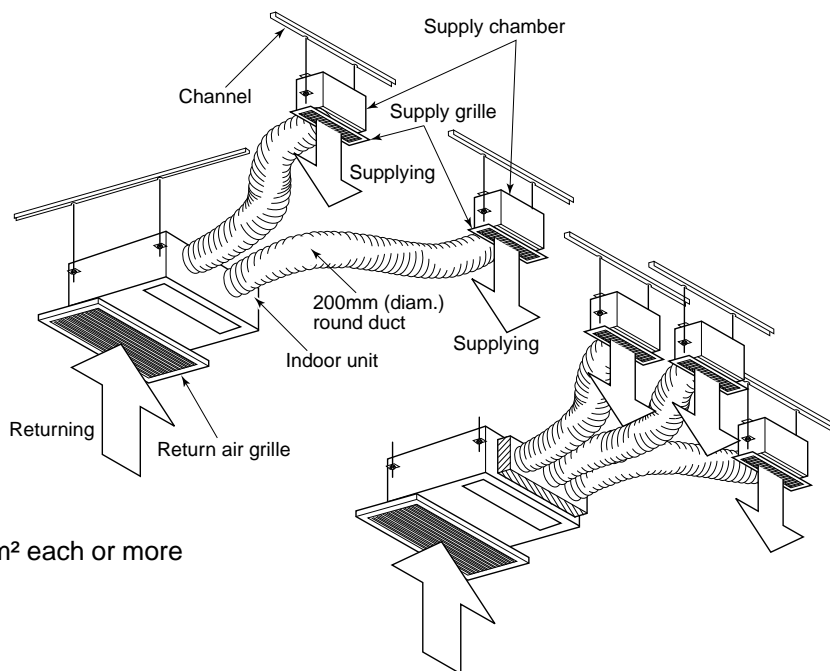
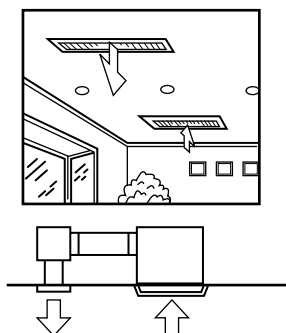


• Removal of air filter



3 INSTALLATION OF INDOOR UNIT

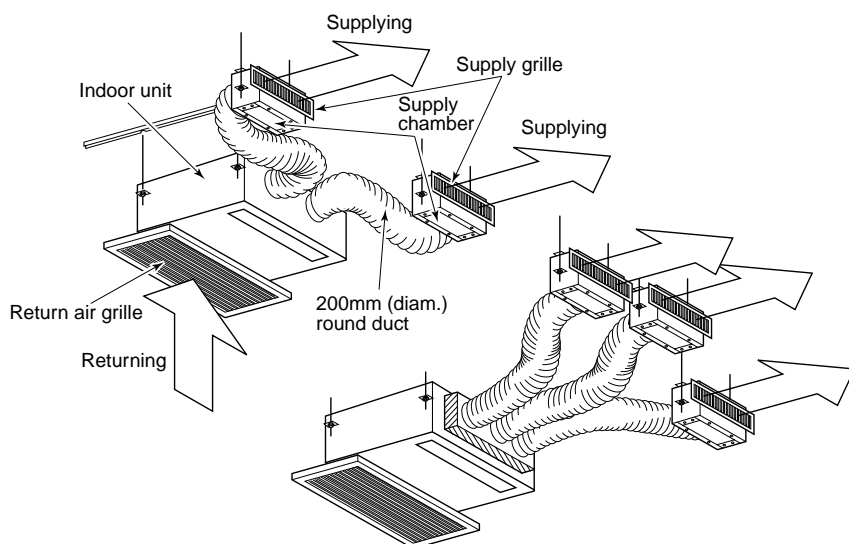
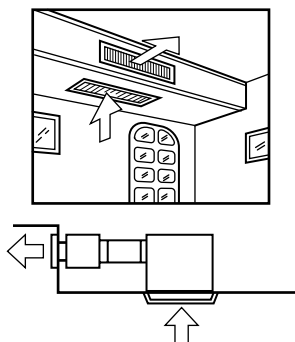
Concealed duct type



NOTE:

- Recommended supplying grille size 400 cm² each or more

Ledge ceiling concealed duct type



Quality of supplying grilles

SM561BT	2
SM801BT	3
SM1101BT	4
SM1401BT	4

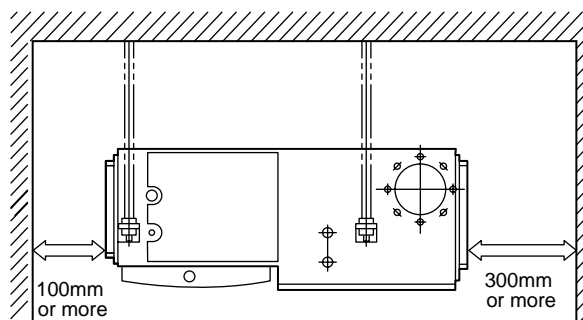
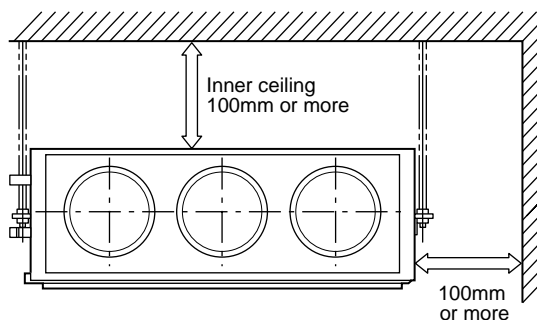
NOTE:

- Opening area of the return grille should be larger than the one for suction port (Air filter) of the indoor unit.

Restriction to installation

1. Installation clearance

- As shown in the figure, keep clearance around the indoor unit.



4 AIR DUCTING WORK

Static pressure characteristics of each model

Fig. 1 RAV-SM561BT (Round duct)

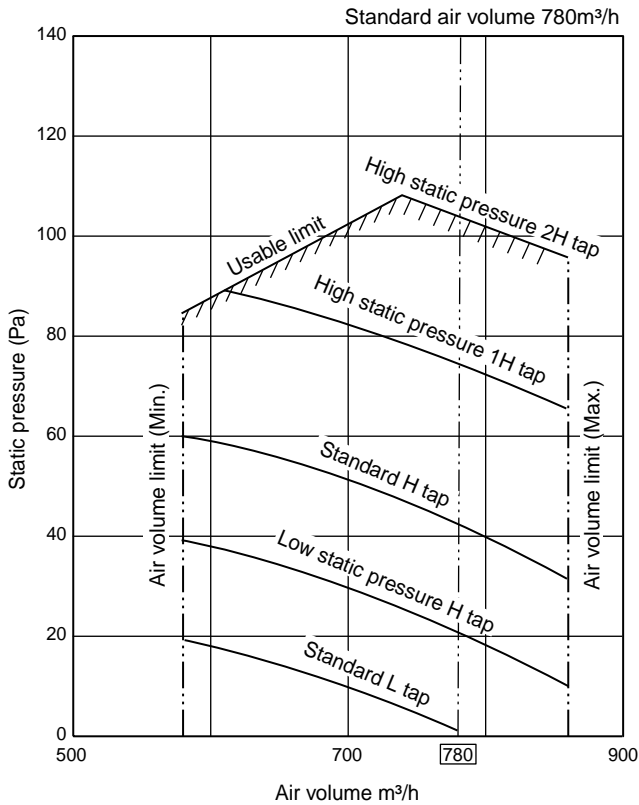


Fig. 3 RAV-SM801BT (Round duct)

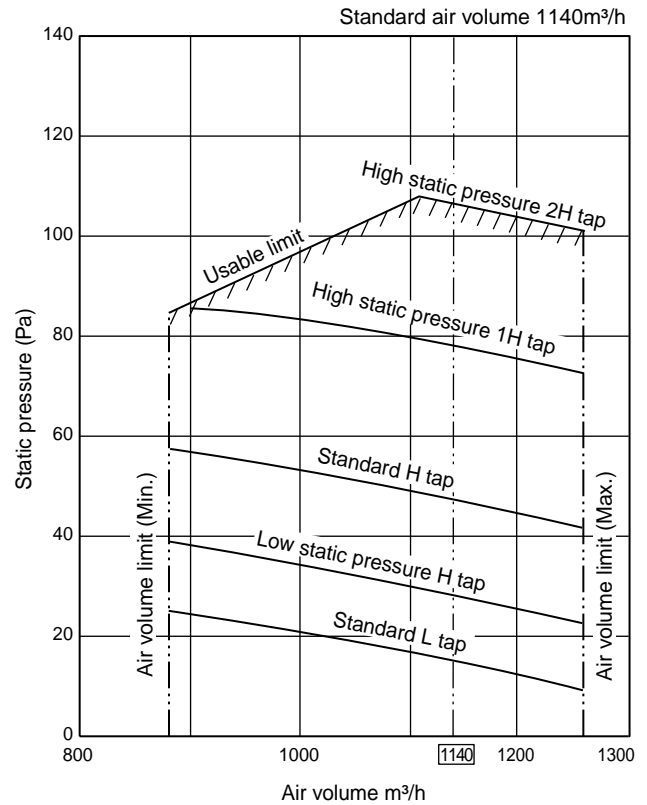


Fig. 2 RAV-SM561BT (Square duct)

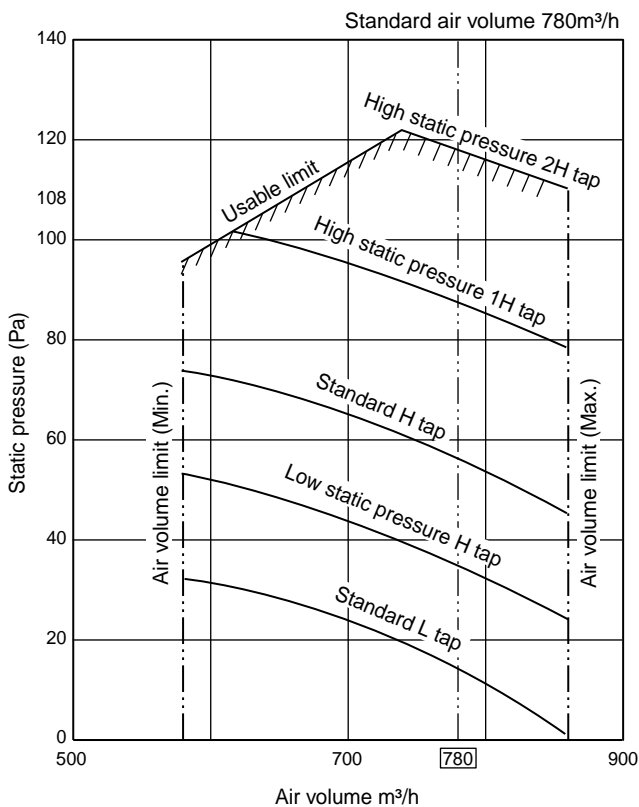
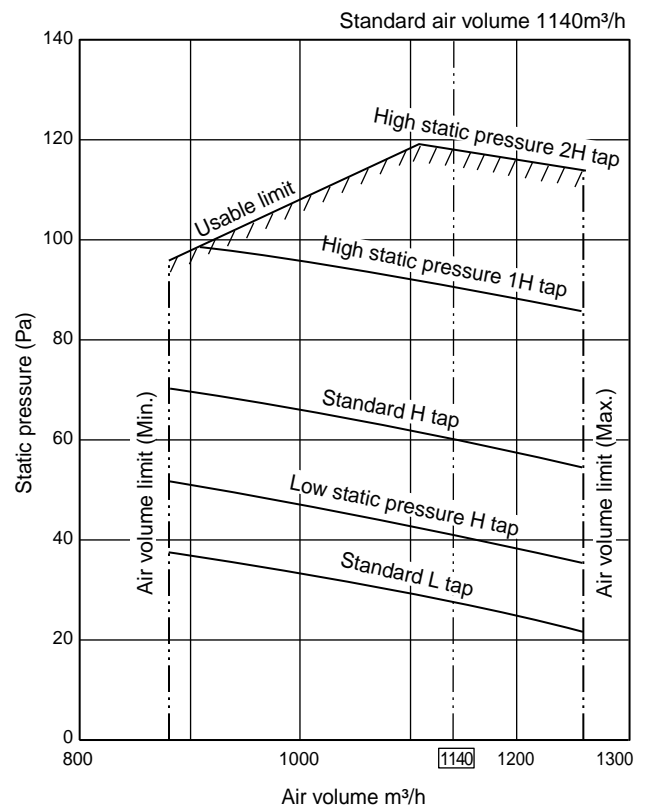


Fig. 4 RAV-SM801BT (Square duct)



4 AIR DUCTING WORK

Fig. 5 RAV-SM1101BT (Round duct)

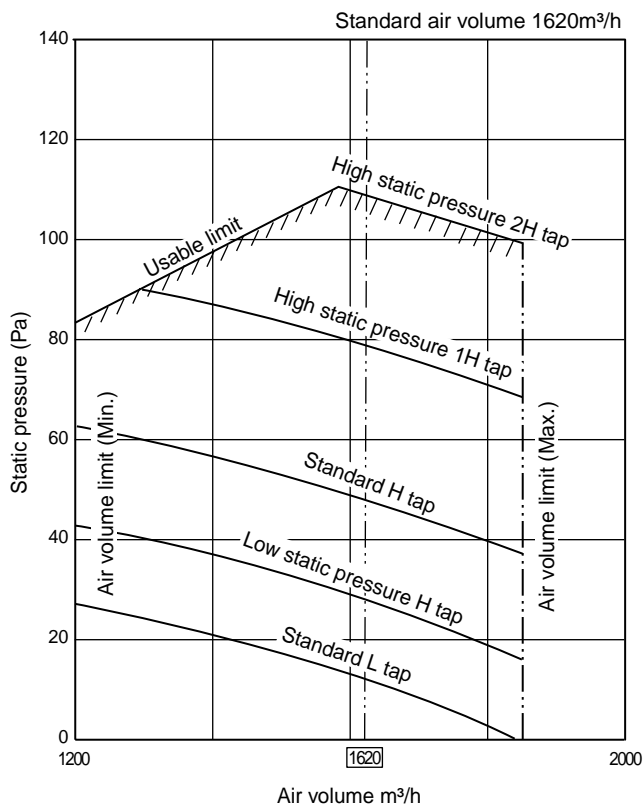


Fig. 7 RAV-SM1401BT (Round duct)

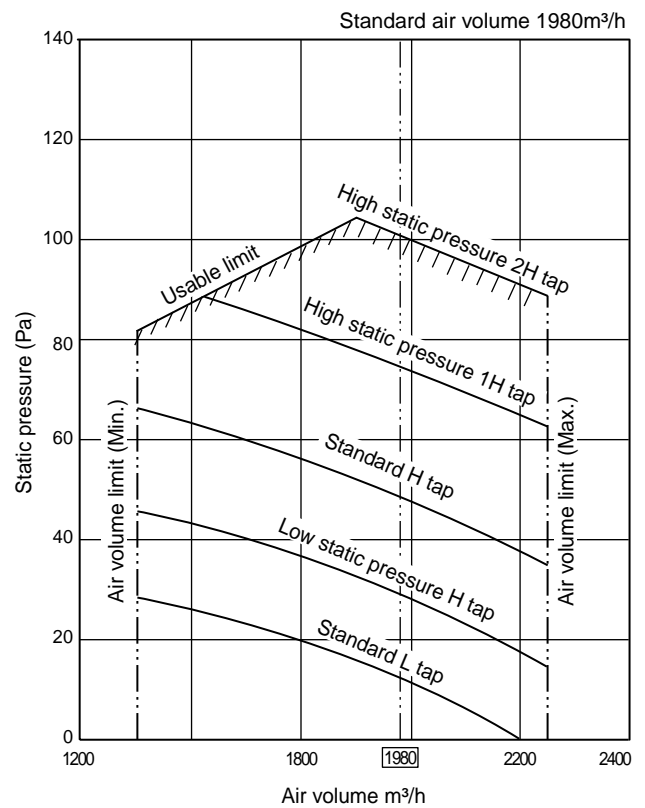


Fig. 6 RAV-SM1101BT (Square duct)

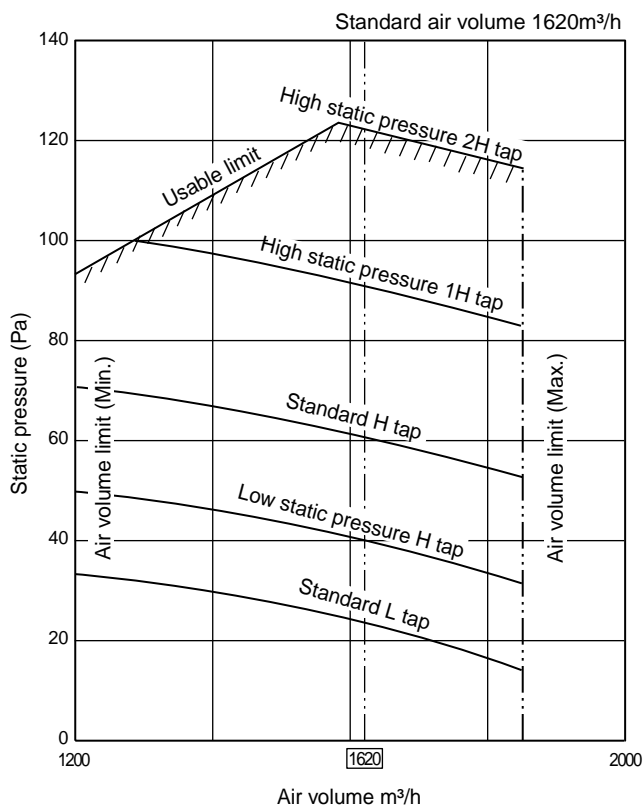
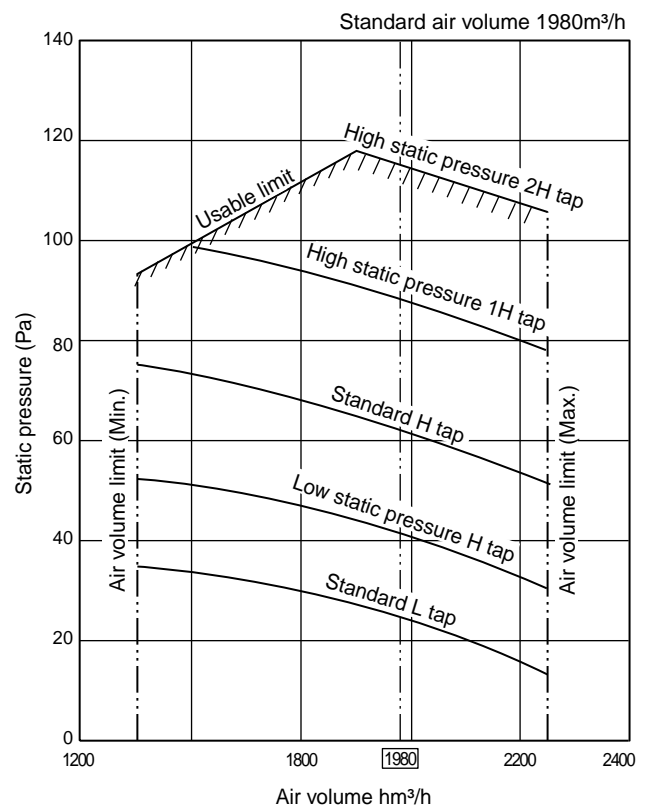


Fig. 8 RAV-SM1401BT (Square duct)

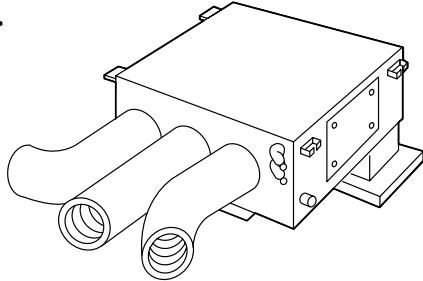


Installation reference

(Example for RAV-SM801BT model)

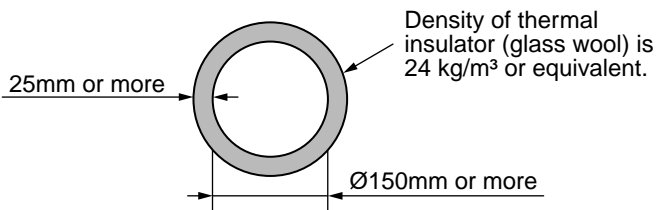
The air supply ducting work is classified in two ways, one is branched by the round ducts, and the other is branched by the square ducts. (Be sure to divide the air supply duct into three or more branches.)

<Round duct>



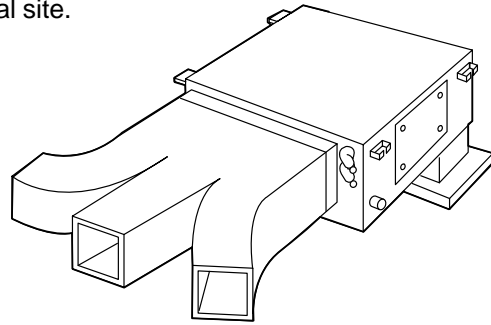
In case of the round duct, use the thermal insulator of thickness 25mm or more and inner diameter 150mm or more to the duct board.

(If the inner diameter is not enough, resistance increase, as the result, air does not flow smoothly and loss of the static pressure increases.) For the thermal insulator, use high-density glass wool of 24kg/m³ or equivalent.

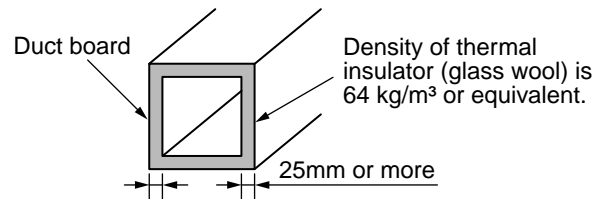


<Square duct> (Reference for square duct)

When using the square duct, change the type of the air supply flange from round type to square flange at the local site.



In case of the square duct, apply the thermal insulator of thickness 25mm or more to the duct board. For the thermal insulator, use high-density glass wool of weight 64kg/m³.



Connecting method of the duct

1. Supply air side

<Round duct>

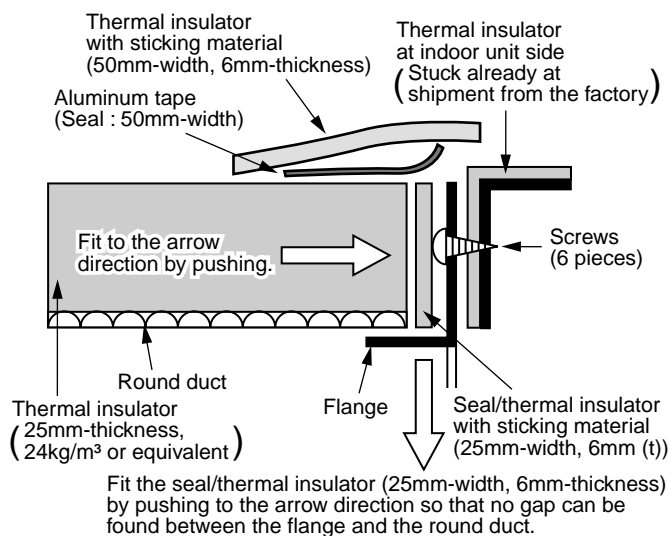


Fig. 2 (a)

<Square duct>

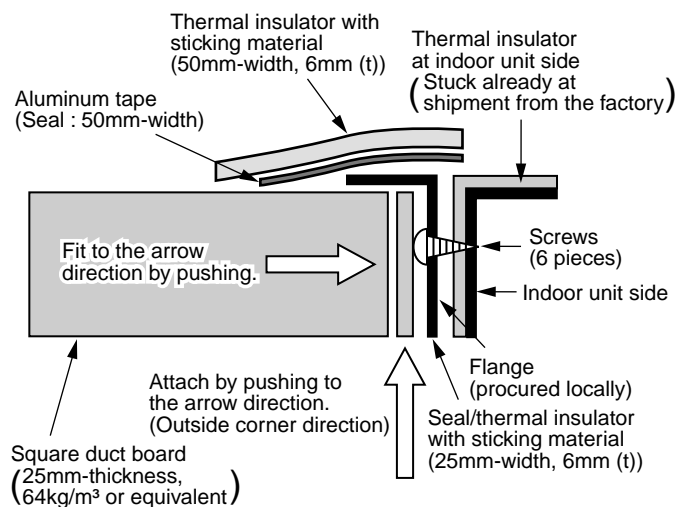


Fig. 2 (b)

CAUTION

Incomplete thermal insulation of the supply air flange and sealing may cause dew drops.

4 AIR DUCTING WORK

Connecting method of the duct

1. Supply air side

<Round duct>

1. Make the round duct according to inner dimension of the flange
Use a glass wool board with inside/outside finishing 25mm-thickness and 24kg/m³-density.
2. Connect the flange and each type of duct. (Fig. 1)

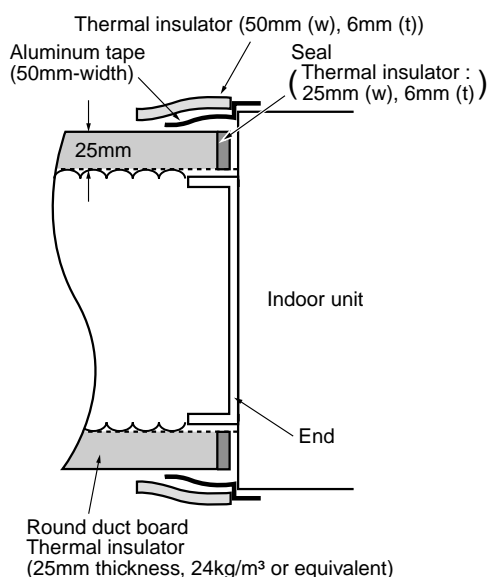


Fig. 1

<Square duct>

1. Using 6 screws, mount the flange to the supply air port of the indoor unit. (Fig. 2)
2. Make the square duct according to inner dimension of the flange $A \times B$.
Use a glass wool board with inside/outside finishing 25mm-thickness and 24kg/m³-density.
3. Connect the flange and each type of duct. (Fig. 3)

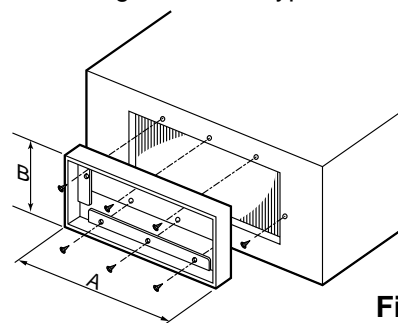


Fig. 2

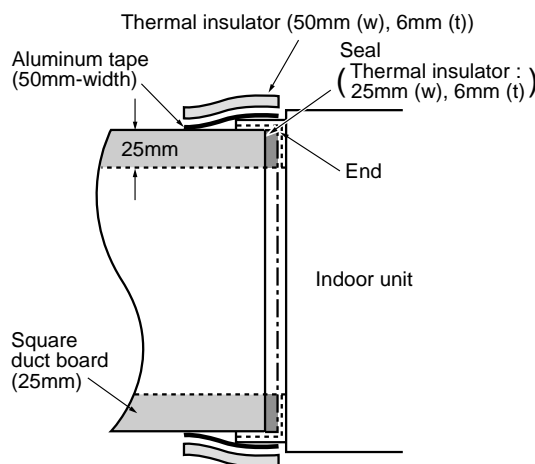


Fig. 3

Points at installation work

■ General cautions

1. Considering installation places of indoor unit supply chamber, structure of the building and determine the duct path.
2. In order to utilize the static pressure characteristics of the air supply in the indoor unit, design the duct branching having the large size of the air supply chamber or setting distance to the first branch as long as possible (Min. : 200mm or longer) so that an even air volume can be obtained.

Especially, when branching just after air supply of the indoor unit, air concentrates at the center part and is difficult to flow to the ducts at both sides.

3. Connect each connecting section surely, and apply sufficient thermal insulation.

In this model of which the duct is branched in the ceiling, compared with the model for ordinary houses, the high temperature generates on the periphery in the cooling time (Especially, at attic and etc.), temperature difference increases between the supply air and outside of the duct, and dewing may occur.

Dewing on the surface of the thermal insulator covering the metal connecting section or leaking portion of the cooled air may cause a trouble such as water drops.

4. Thermal insulation of screwing sections is necessary.

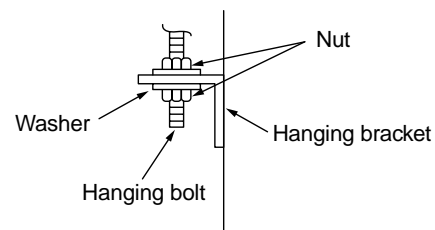
Prevent dewing by applying thermal insulation to 6 screws those fix the duct flange of the air supply chamber.

- For duct parts, the flexible branch duct (thermal insulation, 25mm or more thickness) is recommended.
- Adjust the duct length to 6m or less even for straight pipe, and avoid sharp bending (Air flow resistance is large.) if bending.

Hanging of indoor unit

Lift up the unit with a lifter, etc., and set the hanging metal in the hanging bolt.

- Hook nut of the hanging bolt to the groove of the hanging metal on the main unit.
- Using the level, etc., install the main unit horizontally.
Failure to do this will cause water leakage



Mounting of filter and canvas for suction port

1. Mount a long-life filter or a high-performance filter according to each Installation Manual.
2. Mount the canvases for suction port to the lower side of the above filter.

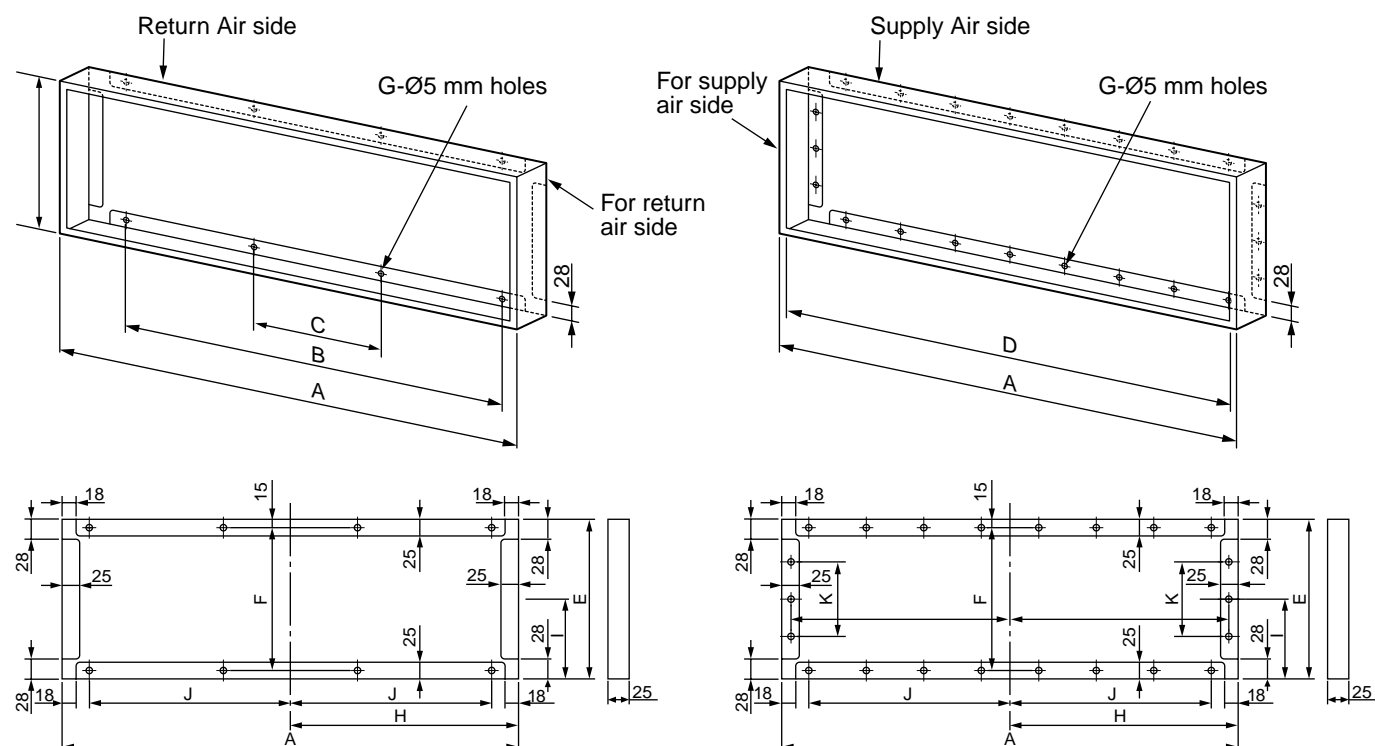
Mounting of remote controller

For the mounting of the wired remote controller, refer to the Installation Manual attached to the remote controller.

- Take out the remote controller cord together with the refrigerant pipe or drain pipe. Be sure to set the remote controller cord so that it passes through the upper side of the refrigerant pipe and drain pipe.

For reference

<Square duct> (Procured locally)



	Model	A	B	C	D	E	F	G	H	I	J	K
Return Air side (Return filter side)	SM561BT	700	—	400	—	420	390	4	350	195	—	—
	SM801BT	1000	700	430	—	420	390	8	500	195	350	—
	SM1101, 1401BT	1350	1050	580	—	420	390	8	675	195	525	—
Supply Air side	SM561BT	550	455 (65 x 7)	65	530	265	245	20	275	132.5	227.5	130
	SM801BT	850	715 (65 x 11)	65	830	265	245	28	425	132.5	307.5	130
	SM1101, 1401BT	1200	1105 (65 x 17)	65	1180	265	245	40	600	132.5	552.5	130

5 DRAIN PIPING WORK

Piping material

- For laying pipes underground, use hard vinyl chloride pipe. VP25 (Inner diameter Ø32mm)

Piping and cautions

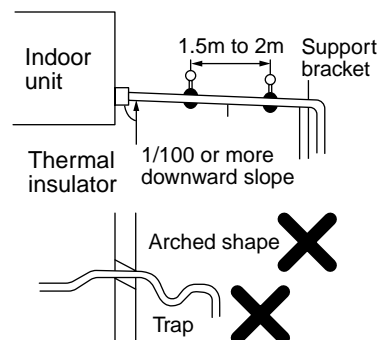
- Set drain side of pipe at downward slope. (1/100 or more)
- Be sure to apply thermal insulation (foaming polyethylene, 10mm-thickness or more) for pipes passing through the room.
- Adhere the connecting sections with vinyl chloride agent surely so that no water leakage is caused.
 - Apply adhesive agent without unevenness around the portion approx. 40mm from the end of hard polyvinyl-chloride pipe.
- Push the vinyl pipe in the drain socket completely up to the end of the socket.
- Do not apply strength to the connecting part until the adhesive agent has dried and hardened.
- Support the piping with hanging bracket so that the force is not applied to connection sections of pipe and pipe is not waved.

NOTES :

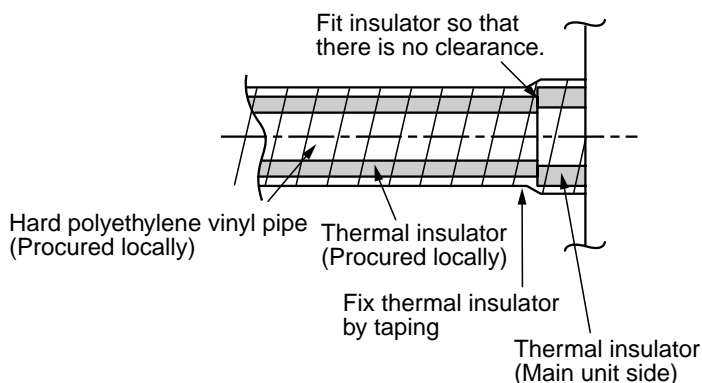
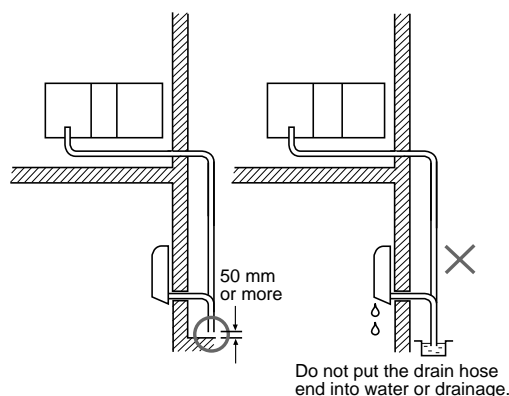
- Do not make slack or trap at halfway across piping.
- Set pipes so that the end of drain pipe is not dipped in water, and also keep space 50mm or more to the ground.
- After piping work, check if water drains smoothly.
- Hole should be made at a slight downward slant to the outdoor side.
- When connecting extension drain hose, insulate the connecting part of extension drain hose with shield pipe.

Thermal-insulating process

- After checking water drain, be sure to apply the thermal-insulating for connecting portion of the pipes.
- Apply taping so that there is no clearance on the fitting part of thermal-insulator of the main unit with the insulator procured locally.



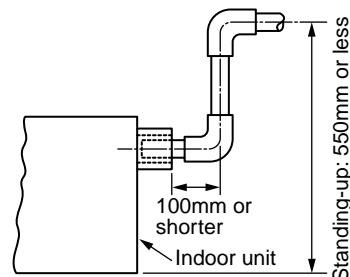
- As shown in the figure, set the collective piping such as the ceiling duct so that waste water does not back up from the main pipe.



Drain-up

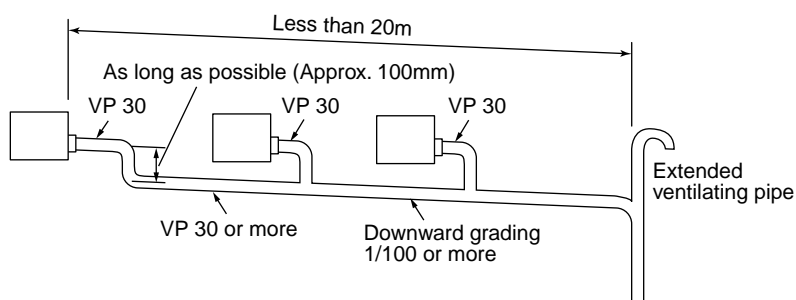
If down-slope cannot be set on a drain pipe, drain-up is possible.

- Set the height of drain pipe 550mm or less from the bottom face of the indoor unit.
- Pull out the drain pipe from connecting port of the drain pipe of the indoor unit by 100mm or shorter, and stand up it vertically.
- After standing up it vertically, arrange immediately so that it is set with down-slope.



Connection of the drain hose

- Insert the drain hose completely into the connecting port of the drain pan.
- Apply thermal insulation surely to the drain hose with socket thermal insulation seal.



Check of water drain

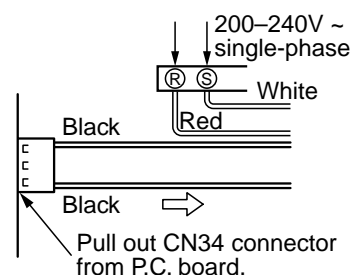
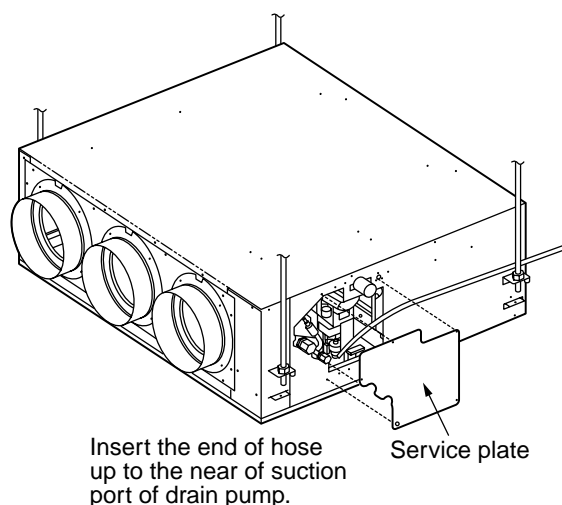
After drain pipe work, check that water is drained and there is no water leak from pipe connection portion. In this time, also check there is no trouble of motor sound of the drain pump. Be sure also to perform this check when installing the unit in heating time.

After electric piping work

- Before installing a panel, infuse water as shown in the following figure. By operating the unit in COOL mode, check that water is drained from the drain pipe and then check there is no water leak from the drain pipe.

Before electric piping work

- Pull out the float switch connector (3P: Red) from connector (CN34: Red) on P.C. board of the electric parts box. (In this time, be sure to check the power has been turned off.)
- Connect 200V single-phase to (R) and (S) of the power supply terminal block. (Never apply 200V to (A), (B), (U₁), and (U₂) of the terminal block, otherwise it causes a trouble of P.C. board.
- Infuse water followed to the figure below. (Water amount: 1500cc to 2000cc)
- The drain pump automatically operates by power-on. Check that water is drained from the drain pipe and then check there is no water leak from the drain pipe.
- After checking water drain and water leak, turn off the power, connect the float switch connector to the original position (CN34) of P.C. board, and then return the electric parts box to the original position.



6 REFRIGERANT PIPING

Refrigerant piping

1. If the outdoor units are to be mounted on a wall, make sure that the supporting platform is sufficiently strong. The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. Use copper pipe with 0.8 mm or more thickness.
3. Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

CAUTION

IMPORTANT 4 POINTS FOR PIPING WORK

1. Remove dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (connected points)

Permissible piping length and heat

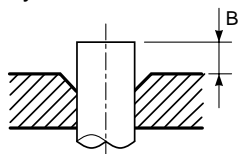
The maximum piping length from the outdoor to indoor unit	
30 m (Chargeless 20 m) (RAV-SM561/801AT)	15 m (Chargeless 15 m) (RAV-SM1101/1401AT)
The maximum height difference outdoor/indoor unit	
Outdoor unit is above	Outdoor unit is below
30 m	30 m

Flaring

Insert a flare nut into the pipe, and flare the pipe.

As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

However, the conventional tools can be used by adjusting projection margin of the copper pipe.



• Projection margin in flaring : B (Unit : mm)

Rigid (Clutch type)

Outer diam. of copper pipe	R410A tool used		Conventional tool used	
	R410A	R22	R410A	R22
6.4 to 15.9	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0

Imperial (Wing nut type)

Outer diam. of copper pipe	R410A	R22
6.4 or 9.5	1.5 to 2.0	1.0 to 1.5
12.7 or 15.9	2.0 to 2.5	1.5 to 2.0

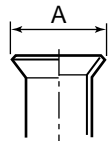
• Flaring dia meter size : A (Unit : mm)

Outer diam. of copper pipe	A $\begin{smallmatrix} +0 \\ -0.4 \end{smallmatrix}$	
	R410A	R22
6.4	9.1	9.0
9.5	13.2	13.0
12.7	16.6	16.2
15.9	19.7	19.4

* In the case of flaring for R410A with the conventional flare tool, pull out it approx.

0.5 mm more than that for R22 to adjust to the specified flare size.

The copper pipe gauge is useful for adjusting projection margin size.



Tightening connection

CAUTION

- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

(Unit : N•m)

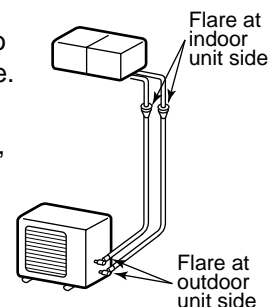
Outer diam. of copper pipe	Tightening torque
6.4 mm (diam.)	14 to 18 (1.4 to 1.8 kgf•m)
9.5 mm (diam.)	33 to 42 (3.3 to 4.2 kgf•m)
12.7 mm (diam.)	50 to 62 (5.0 to 6.2 kgf•m)
15.9 mm (diam.)	63 to 77 (6.3 to 7.7 kgf•m)

• Tightening torque of flare pipe connections

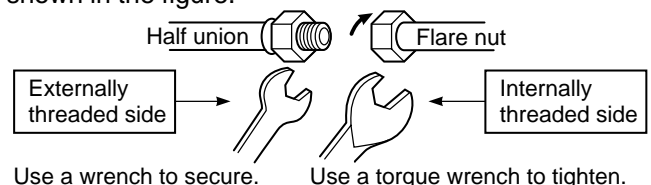
Pressure of R410A becomes higher than that of R22.

(Approx. 1.6 times) Therefore, using a torque wrench, tighten firmly the flare pipe connecting sections which connect the indoor and outdoor units up to the specified tightening torque.

Incorrect connections may cause not only a gas leakage, but also a trouble of the refrigeration cycle or compressor damage.



Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



7 EVACUATING

AIR PURGE

Evacuate the air in the connecting pipes and in the indoor unit using vacuum pump.

Do not use the refrigerant in the outdoor unit.

For details, see the manual of vacuum pump.

Use a vacuum pump

Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops.

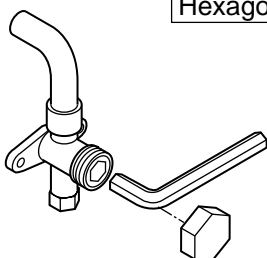
1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
2. Connect the charge hose to the port of vacuum pump.
3. Open fully the low pressure side handle of the gauge manifold valve.
4. Operate the vacuum pump to start evacuating.
Perform evacuating for about 35 minutes if the piping length is 30 meters total for model SM560 and 50 meters for model SM800, SM1100, SM1400 (assuming a pump capacity of 27 liters per minute.) Then confirm that the compound pressure gauge reading is -101 kPa (-76 cmHg).
5. Close the low pressure side valve handle of gauge manifold.
6. Open fully the valve stem of the packed valves (both sides of Gas and Liquid).
7. Remove the charging hose from the service port.
8. Securely tighten the caps on the packed valves.

Packed valve handling precautions

- Open the valve stem all the way out ; do not try to open it beyond the stopper.
- Securely tighten the valve stem cap at the torque as follows:

15.9 mm (diam.)	68 to 82 N•m (6.8 to 8.2 kgf•m)
12.7 mm (diam.)	50 to 62 N•m (5.0 to 6.2 kgf•m)
9.5 mm (diam.)	33 to 42 N•m (3.3 to 4.2 kgf•m)
6.4 mm (diam.)	14 to 18 N•m (1.4 to 1.8 kgf•m)

Hexagonal wrench is required.



Open valve fully

Open valves of the corresponding outdoor units fully.

Gas leak check

Using a lead detector or soap water, check there is no gas leak from pipe connecting portion or caps of the valves.

REQUIREMENT

For a leak detector, use one manufactured exclusively for HFC refrigerant (R410A, R134a, etc.)

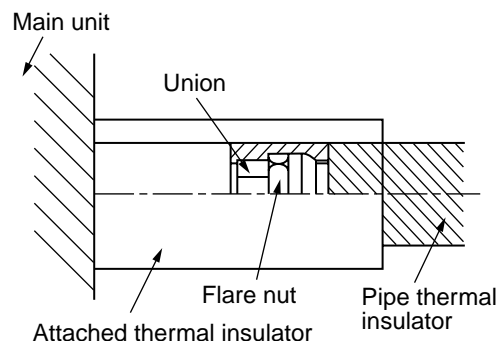
Thermal-insulating process

Perform pipe thermal-insulating process for liquid and gas sides separately.

- For thermal insulator to pipes at gas side, use one with heat resisting temperature 120°C or higher.
- Using the attached thermal insulator, perform surely thermal insulation without gap for pipe connecting portion of the indoor unit.

REQUIREMENT

Perform surely thermal insulation process so that the naked end of pipe connecting portion of the indoor unit does not appear.
(Exposure of the pipe may cause water leak.)

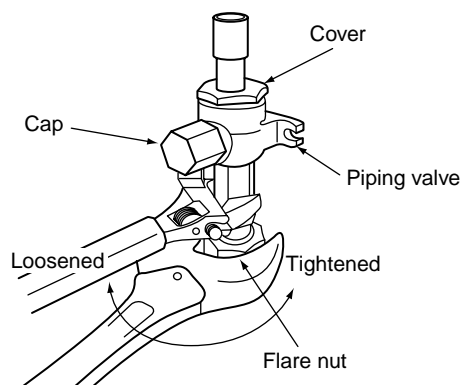


7 EVACUATING

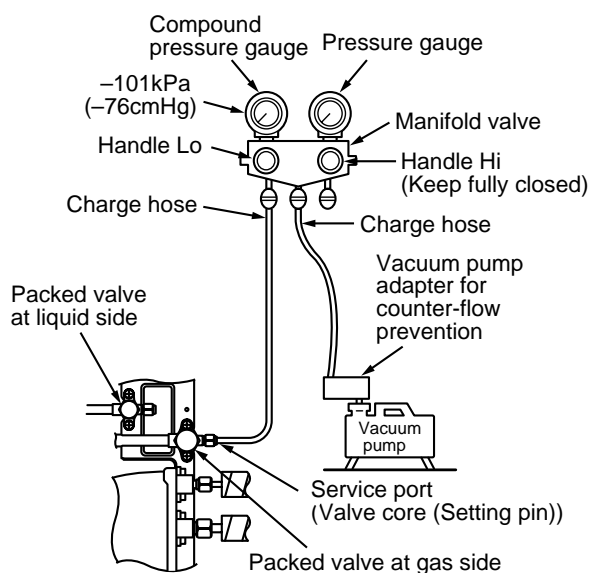
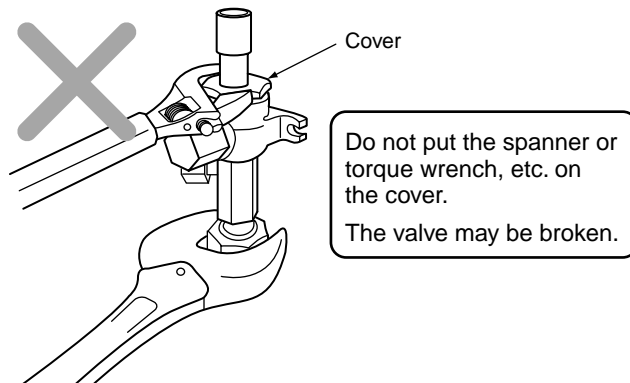
<For 801, 1101, 1401AT model>

- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.

On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.



801, 1101, 1401 type valve at gas side



8 ELECTRICAL WORK

NOTE:

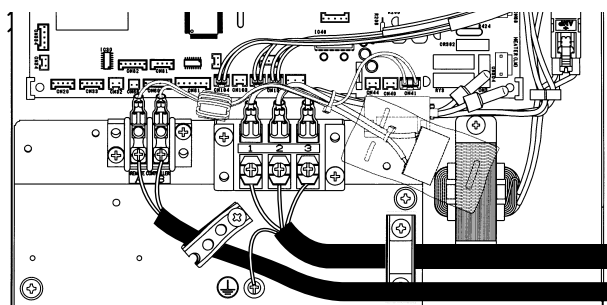
For selection and connection method of the power supply cords, refer to the details in the Installation Manual of the outdoor unit.

CAUTIONS

- Be sure connect earth wire.
Do not connect the earth wire to gas pipe, pipe of water supply, lightning conductor, and earth wire of telephone.
An incomplete grounding causes an electric shock.
- If incorrect/incomplete wiring is carried out, it may cause an electrical fire or smoke.
- Prepare the power supply for exclusive use with the air conditioner.
- Be sure to use the cord clamps with attached to the product.
- Using the specified cables, connect the cables surely so that the external force of cable is not transmitted to the terminal connecting portion.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations on running the wire from outdoor unit to indoor unit (wire size of wire and wiring method etc.)
- Use the power cord and Inter-connecting cable of specified thickness, specified type, and protective devices required.
- Never connect 220-240V power to the terminal blocks for communication ((A), (B))
(It causes a trouble.)

How to wire

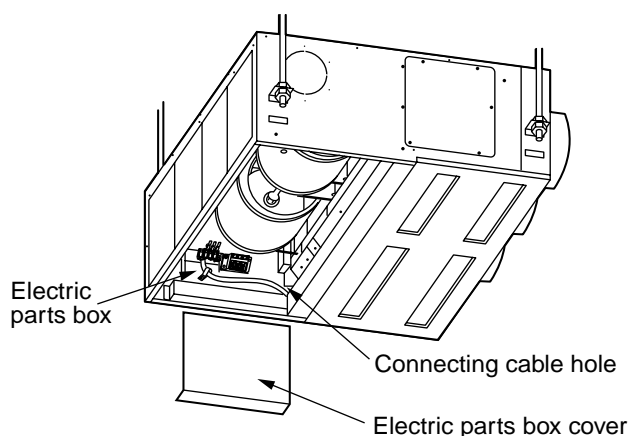
1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit. H07 RN-F or 245 IEC 66 (1.5 mm² or more)
2. Mount a leakage breaker.
3. Insulate the unsheathed redundant cords (conductors) with tape.
4. For inter-unit wiring, do not use a wire jointed to another on the way.
5. Fix the cable with cord clamp.



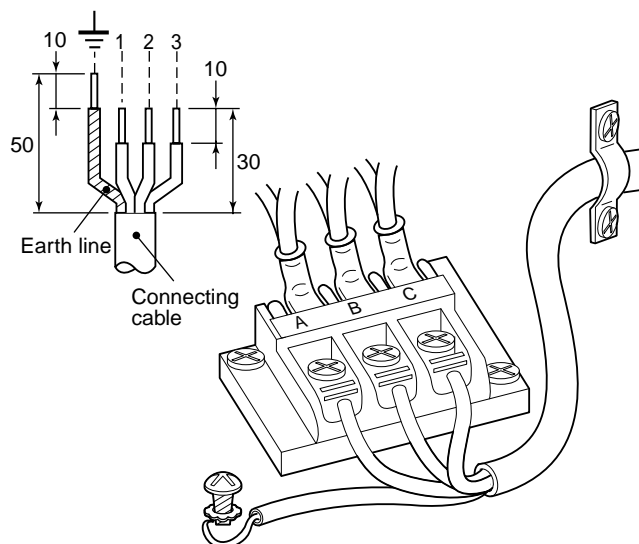
8 ELECTRICAL WORK

Cabling

1. As shown in the figure, remove a screw ① and then remove cover of the electric part.
2. Strip wire ends (10 mm).
3. Match wire colors with terminal numbers on indoor and outdoor units' terminal blocks and firmly screw wires to the corresponding terminals.
4. Connect the ground wires to the corresponding terminals.
5. Fix the cable with cord clamp.
6. Fix cover of the parts box and the terminal block surely with the fixing screws.

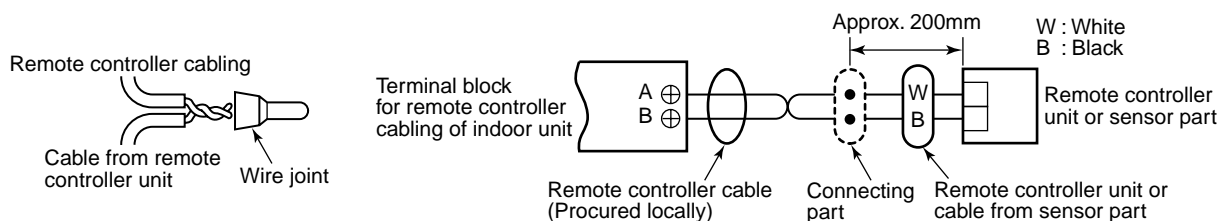


Make a loop for the margin of the cable length so that the electric parts box can be taken out during servicing.



Remote controller cabling

- Strip approx. 14mm the cable to be connected.
- Non polarity, 2 core cable is used for cabling of the remote controller.
- Twist cable of the remote controller to be connected with cable of the remote controller unit (or sensor), and press-fit them with a wire joint. (Wire joints (White: 2 pieces) are included in the attachments to the remote controller (sold separately) or the wireless remote controller kit (sold separately)).



Cabling diagram

- For details of cabling/installation of the remote controller, refer to the Installation Manual attached to the remote controller.
- When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on. It is not a trouble, but is because the setup of the remote controller is being checked. For the second power-ON time and after, approx. 1 minute is required to start the operation by the remote controller.

9 TEST RUN

Before test run

- Before turning on the power supply, carry out the following procedure.
 - Using 500V-megger, check 1MΩ or more exists between the terminal block 1 to 3 and the earth.
If 1MΩ or less is detected, do not run the unit. Do not apply to the remote controller circuit.
 - Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.

How to execute a test run

Using the remote controller, operate the unit as usual.

For the procedure of the operation, refer to the attached Owner's Manual.

A forced test run can be executed in the following procedure if the operation stops by thermo.-OFF.

In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

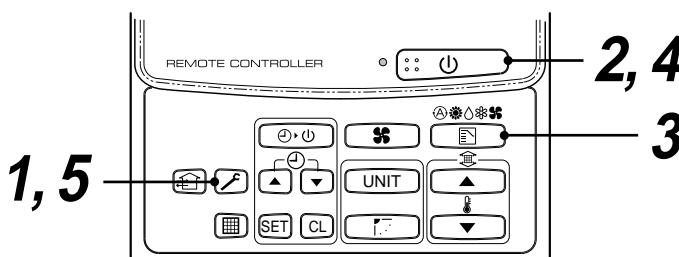
CAUTION


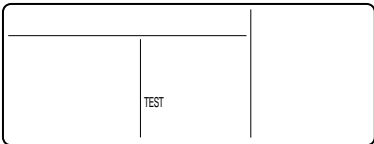
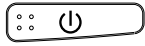

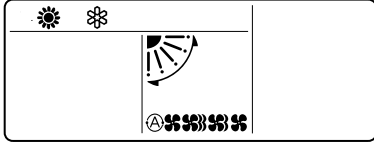
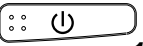

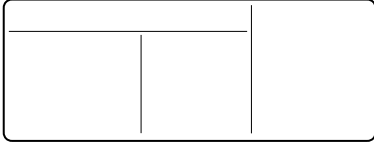
When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on.
It is not a trouble, but is because the setup of the remote controller is being checked.
For the second power-ON time and after, approx. 1 minute is required to start the operation by the remote controller.

NOTE

Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.

In case of wired remote controller



Procedure	Description	
1	Keep  button pushed for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.	
2	Push  button.	
3	Using  button, select the operation mode, [COOL] or [HEAT]. <ul style="list-style-type: none"> Do not run the air conditioner in a mode other than [COOL] or [HEAT]. The temperature controlling function does not work during test run. The detection of error is performed as usual. 	
4	After the test run, push  button to stop a test run. (Display part is same as procedure 1 .)	
5	Push  check button to cancel (release from) the test run mode. ([TEST] disappears on the display and the status returns to a normal.)	

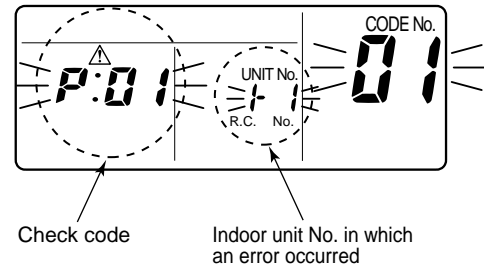
10 TROUBLESHOOTING

Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.

The check code is only displayed during the operation.

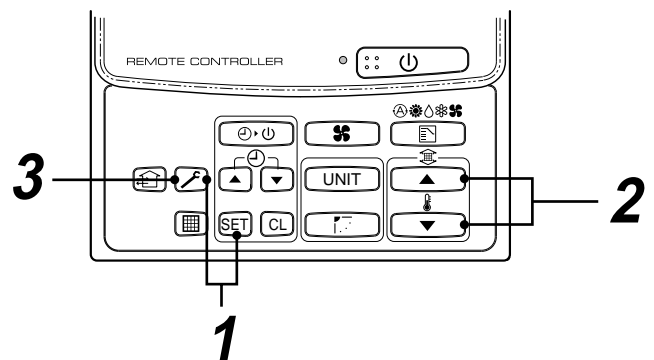
If the display disappears, operate the air conditioner according to the following "Confirmation of error history" for confirmation.



Confirmation of error history

When a trouble occurred on the air conditioner, the trouble history can be confirmed with the following procedure. (The trouble history is stored in memory up to 4 troubles.)

The history can be confirmed from both operating status and stop status.



Procedure	Description
1	<p>When pushing [SET] and buttons at the same time for 4 seconds or more, the following display appears.</p> <p>If [Service check] is displayed, the mode enters in the trouble history mode.</p> <ul style="list-style-type: none"> [01 : Order of trouble history] is displayed in CODE No. window. [Check code] is displayed in CHECK window. [Indoor unit address in which an error occurred] is displayed in UNIT No.
2	<p>Every pushing of [,] button used to set temperature, the trouble history stored in memory is displayed in order.</p> <p>The numbers in CODE No. indicate CODE No. [01] (latest) → [04] (oldest).</p> <p>REQUIREMENT</p> <p>Do not push button because all the trouble history of the indoor unit will be deleted.</p>
3	<p>After confirmation, push button to return to the usual display.</p>

1. Check the troubles according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner.
3. More details of the service code are explained in Service Manual.

11 APPLICABLE CONTROLS

NOTIFICATION

When using the equipment at the first time, it will take a lot of time that the remote controller accepts an operation after power was on. However, it is not a trouble.

• Automatic address

- While automatic addressing, the operation cannot be performed on the remote controller.
- For automatic addressing, Max. 10 minutes (generally, approx. 5 minutes) are required.

• When power will be turned on after finish of automatic addressing;

- It will require Max. 10 minutes (generally, approx. 3 minutes) that outdoor unit starts operation after power was on.

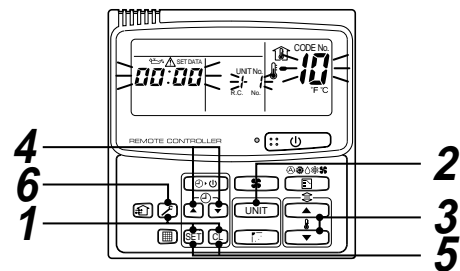
As all the buttons have been set to [Standard] at the shipment, change the setup of the indoor unit if necessary. To change the setup, use the main remote controller (wired remote controller).

* The setup change for wireless remote controller, sub remote controller, or remote controller-less system (Central control remote controller only is provided.) is impossible. In these cases, prepare and mount a separate main remote controller.

Exchange of applicable control setup

Basic operation procedure for setup exchange

Change the setup while operation of the equipment stops.
(Be sure to stop the operation of a set.)



Procedure	Description
1	<p>When pushing SET, CL, and F buttons simultaneously for 4 seconds or more, after a while, the display part flashes as shown in the figure.</p> <p>Check that the displayed item code is [10].</p> <ul style="list-style-type: none"> • If the item code indicates other than [10], push F button to erase the display, and then retry the operation from the first step. (For some time after F button has been pushed, the operation of the remote controller cannot be accepted.) <p>(In a group control, the firstly displayed indoor unit No. becomes the master unit.)</p> <p>(* The display changes according to the indoor unit model.)</p>
2	<p>Every pushing UNIT button, the indoor unit No. in the group control is displayed successively. Select an indoor unit of which setup to be changed.</p> <p>In this time, the position of the indoor unit of which setup to be changed can be confirmed because the fan and the flap of the selected indoor unit work.</p>
3	<p>Using UP, DOWN buttons of set temperature, specify the item code [**].</p>
4	<p>Using UP, DOWN buttons of set timer, select set data [****].</p>
5	<p>Push SET button. In this time, if the display changes from flashing to lighting, the setup completes.</p> <ul style="list-style-type: none"> • To change the setup of an indoor unit other than the selected one, start operation from Procedure 2. • To change the setup of another setup in the selected indoor unit, start operation from Procedure 3. <p>Pushing CL button clears the set up contents which have been already set. In this case, retry from Procedure 2.</p>
6	<p>When the setup finished, push F button. (The setup is determined.)</p> <p>Pushing F button deletes the display and returns the status to normal stop status.</p> <p>(For some time after F button has been pushed, the operation of the remote controller cannot be accepted.)</p>

11 APPLICABLE CONTROLS

Setup of external static pressure

Matching with the resistance (External static pressure) of the duct to be connected, be sure to set up the tap exchange according to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).

- For the item code in Procedure 3, specify [5d].
- For the set data in Procedure 4, select the setup data of static pressure outside of the machine to be set up from the table below.

(Exchange by wired remote controller)

Set data	External static pressure	
0000	40Pa	Standard (At shipment)
0001	70Pa *1	High static pressure 1
0003	100Pa *2	High static pressure 2
0006	20Pa	Low static pressure

*1: For SM1401BT, set 65Pa.

*2: For SM1401BT, set 90Pa.

To incorporate a filter sold separately

When mounting a filter sold separately, be sure to set up the tap exchange according to the type of filter.

In this case, also follow to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).

- For the item code in Procedure 3, specify [5d].
- For the set data in Procedure 4, select the setup data of filter to be incorporated from the table below.

Set data	Filter sold separately
0000	Standard filter (At shipment)
	Optical regeneration deodorizing filter
0001	High-performance filter 65, 90
	Deodorant filter Ammonia deodorizing filter















When using wireless remote controller

To exchange the static pressure, there is a method other than the abovementioned method by wired remote controller, which is to shift the short plug on the indoor microcomputer P.C. board as shown in the following table. Adopt this method in case of using a wireless remote controller, etc.

- However, after exchanging once, be careful to shift the short plug to the standard position (At shipment) in order to return to the standard setup (follow to E2PROM setup) though the setup for high static-pressure 1, high static-pressure 2, or low static-pressure can be arbitrarily performed.

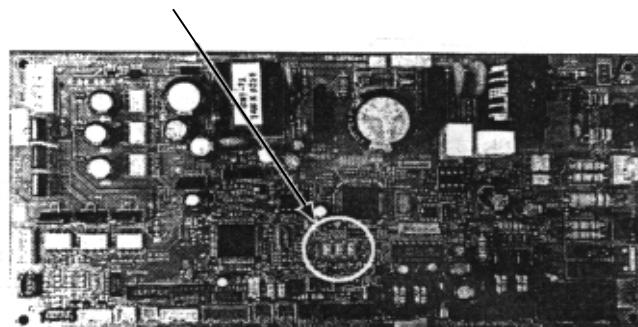
It is necessary to rewrite data from the wired remote controller sold separately in the set data "0000".

- Select with shifting of the short plug on the indoor unit microcomputer P.C. board.

Short plug position	External static pressure	Filter sold separately
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  Short </div> <div style="text-align: center;">  Open </div> </div>		
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  CN112 </div> <div style="text-align: center;">  CN111 </div> <div style="text-align: center;">  CN110 </div> </div>	40Pa Standard (At shipment)	Standard filter (At shipment) Optical regeneration deodorizing filter
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  CN112 </div> <div style="text-align: center;">  CN111 </div> <div style="text-align: center;">  CN110 </div> </div>	70Pa High static-pressure 1	*1 High-performance filter 65 High-performance filter 90 Deodorant filter Ammonia deodorizing filter
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  CN112 </div> <div style="text-align: center;">  CN111 </div> <div style="text-align: center;">  CN110 </div> </div>	100Pa High static-pressure 2	—
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  CN112 </div> <div style="text-align: center;">  CN111 </div> <div style="text-align: center;">  CN110 </div> </div>	20Pa Low static-pressure	—

- *1 Resistance of high-performance filter 65 and 90, deodorant filter, or ammonia deodorizing filter is equivalent to 30Pa. Therefore, set the resistance (external static pressure) of a duct to be connected to 40Pa.

- Short plug position (CN112, CN111, CN110 from the left)



Change of lighting time of filter sign

According to the installation condition, the lighting time of the filter sign (Notification of filter cleaning) can be changed.

Follow to the basic operation procedure

(**1** → **2** → **3** → **4** → **5** → **6**).

- For the item code in Procedure **3**, specify [01].
- For the set data in Procedure **4**, select the setup data of lighting time of filter sign to be changed from the table below.

Set data	Filter sign lighting time
0000	None
0001	150H
0002	2500H (At shipment)
0003	5000H
0004	10000H

Check and test operation

Be sure to test the pipe connections for gas leak.

- Check the flare nut connections, valve stem cap connections and service port cap connections for gas leak with a leak detector or some soap water.

To secure better effect of heating

When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use a circulator, etc. to circulate heat air near the ceiling.

Follow to the basic operation procedure





(**1** → **2** → **3** → **4** → **5** → **6**).





- For the item code in Procedure **3**, specify [06].
- For the set data in Procedure **4**, select the setup data of shift value of detection temperature to be set up from the table below.

Set data	Shift value of detection temp.
0000	No shift
0001	+1°C
0002	+2°C (At shipment)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

12 INSTALLATION/SERVICING TOOLS

Tools

Tools	Applicable to R22 model
Gauge manifold	<input type="checkbox"/> 
Charge hose	<input type="checkbox"/> 
Electronic balance for refrigerant charging	<input type="radio"/> 
Torque wrench (nominal diam. 1/4, 3/8, 1/2, 5/8)	<input type="checkbox"/> 

Tools	Applicable to R22 model
Flare tool (clutch type)	<input type="radio"/> 
Gauge for projection adjustment	— 
Vacuum pump adapter	<input type="radio"/> 
Gas leak detector	<input type="checkbox"/> 

○ : Newly prepared (They are special requirements for R407C, separate from those for R22.)

□ : Existing tools are available.

For the details of the tools, refer to the Installation manual of the outdoor unit.

13 MAINTENANCE

Cleaning of Return grille

Preparation :

1. Turn off the main power supply switch (or breaker) before the unit maintenance.
2. Dismount the Return grille.

Clean the Return grilles with water:

- Wipe down the Return grille with a sponge or towel moistened with a kitchen detergent. (Do not use any metallic brush for cleaning.)
- **Carefully rinse the Return grille to wash out the detergent.**
- **After rinsing the Return grille with water, dry it in the shade.**

CAUTION

- Do not start the air conditioner while leaving the return grille removed.

Cleaning of Air Filters

- If the air filters are not cleared, it not only impairs the cooling performance of air conditioner but causes a failure in the air conditioner such as water drops.

Preparation :

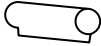

1. Turn off the main power supply switch (or breaker) before the unit maintenance.
2. Dismount the Return grille.





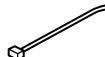
Use a vacuum cleaner to remove dust from the filters or wash them with water.

- After rinsing the air filters with water, dry them in the shade.
- Set the air filter into the air conditioner.


Accessory parts and Parts to be procured locally

□ Accessory parts

Part name	Q'ty	Shape	Usage
Owner's Manual	1	—	—
Installation Manual	1	This manual	—
Installation pattern	1	—	Drawing-out port of hanging bolt pipe
Thermal insulation pipe	2		For thermal insulation of pipe connecting section
Washer	4	M10 × Ø25	For holding down unit
Hose band	2		For connecting drain pipe

Part name	Q'ty	Shape	Usage
Drain hose	1		For connecting drain pipe
Bushing	1		For protection of edge at power taking-in port
Thermal insulator	1		For thermal insulation of drain hose (10t × 200 × 200)
Thermal insulator of top plate	1		For upper pipe hole of indoor unit (6t × 130 × 160)
Banding band	2		For prevention of open of drain hose thermal insulator

<Separate sold parts>

Part name	Q'ty	Shape	Usage
Standard wired remote controller	1		Model RBC-AMT21E

□ Parts to be procured locally

<p>Connecting pipe (Liquid side) (6.4mm (diam.), Nominal (diam.) 1/4" thick 0.8mm) RAV-SM561CT-E</p> <p>(9.52mm (diam.), Nominal (diam.) 3/8" thick 0.8mm) RAV-SM801CT-E, RAV-SM1101CT-E, RAV-SM1401CT-E</p>
<p>Connecting pipe (Gas side) (12.7mm (diam.), Nominal (diam.) 1/2" thick 0.8mm) RAV-SM561CT-E</p> <p>(15.9mm (diam.), Nominal (diam.) 5/8" thick 1.0mm) RAV-SM801CT-E, RAV-SM1101CT-E, RAV-SM1401CT-E</p>
<p>Power supply cord 2.5mm² (H07RN-F or 245IEC66) (20m or less) 3.5mm² (AWG-12) (50m or less)</p>

<p>Connecting cable (indoor and outdoor cable) H07RN-F or 245IEC66 (1.5mm² or more)</p>
<p>Thermal insulation for refrigerant pipe (10mm or more, thermal insulating foam polyethylene)</p>
<p>Thermal insulation for drain pipe (10mm or more, foam polyethylene)</p>
<p>Drain pipe (Outer 26mm (diam.)) (VP20)</p>
<p>Tapes</p>

1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION

New Refrigerant Air Conditioner Installation

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION

To Disconnect the Appliance from Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (25A D type ) must be used for the power supply line of this conditioner.



WARNINGS

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
Do not store it in a wet basement or expose to rain or water.

- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
If a combustible gas leaks, and stays around the unit, a fire may occur.

2 SELECTION OF INSTALLATION PLACE

⚠ WARNING

- **Install the air conditioner at enough strong place to withstand the weight of the unit.**
If the strength is not enough, the unit may fall down resulting in injury.
- **Perform a specified installation work to guard against an earth quake.**
An incomplete installation can cause accidents by the units failing and dropping.
- **Install the air conditioner at a height 2.5m or more from the floor.**
If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

⚠ CAUTION

- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
If a combustible gas leaks and stays around the unit, a fire may occur.

Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.

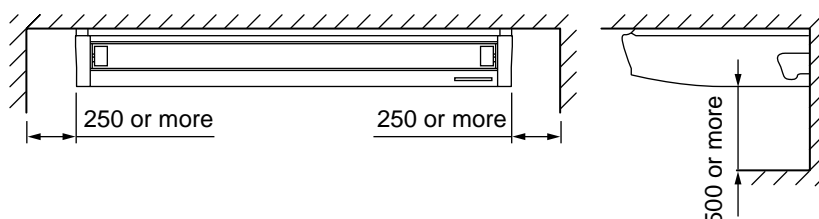
- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
(When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)

Installation space

Secure the specified space in the figure for installation and servicing.



Height of ceiling

Set the installable height of the ceiling within 4m, otherwise the air distribution will become poor.

If height of ceiling exceeds 3.5m, hot air becomes difficult to reach the floor surface, and then the change of setup of high ceiling is necessary.

When incorporating a filter sold separately, the change of setup of high ceiling is also necessary.

For the change method of high ceiling, refer to the application control, "In case of installation to high ceiling" and "In case of incorporating filter sold separately" in this Manual.

List of installable ceiling height

Setup data		
0000	Standard (At shipment)	3.5m or less
0001	High ceiling 1	4.0m or less

According to the conditions of installation, setup time of turning-on of filter sign (notification of filter cleaning) of the remote controller can be changed.

When it is difficult to warm up the room due to installation place or structure of the room, the detection temperature of heating can be raised.

For change the setup time, refer to the application control, "Change of filter sign turning-on time" and "How to increase the heating effect" in this Manual.

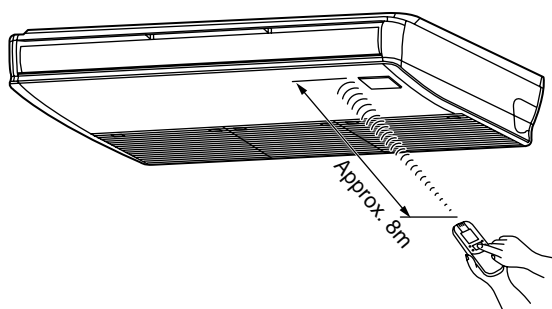
In case of wireless type

Decide the position which remote controller is operated and the installation place.

And then refer to the Installation Manual of the wireless remote controller kit sold separately.

(The signal of the wireless type remote controller can be received within approx. 8m. This distance is a criterion and varies a little according to capacity of the battery, etc.)

- To prevent malfunction, select a place where is not affected by a fluorescent lamp or direct sunlight.
- Two or more (up to 6 units) wireless-type indoor units can be set in a room.

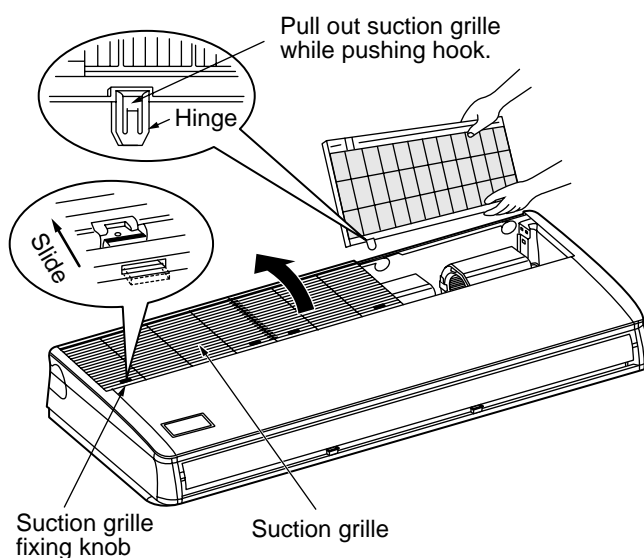


Before installation

1. Removal of suction grille

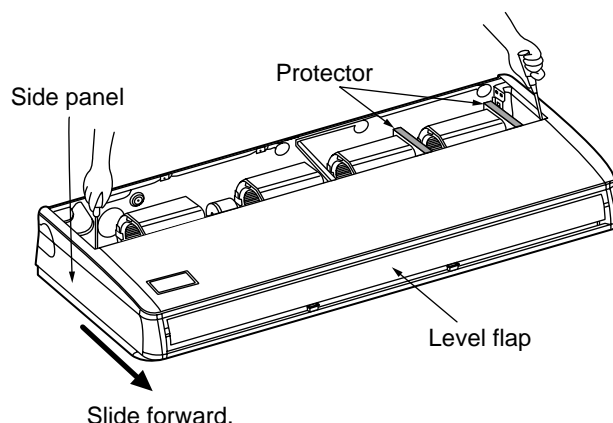
Slide the suction grille fixing knobs (two positions) toward the arrow direction, and then open the suction grille.

Under the condition of suction grille opened, push the hook section of hinges (two positions) at the rear side, and then pull out the suction grille.



2. Removal of side panel

After removing the side panel fixing screws (1 each at right and left), slide the side panel forward and then remove it.



3. Removal of protective vinyl

Peel out the protective vinyl on the level flap.

4. Removal of protector

Remove the protectors (2 pcs.) of the fan.
(RAV-SM801CT only)

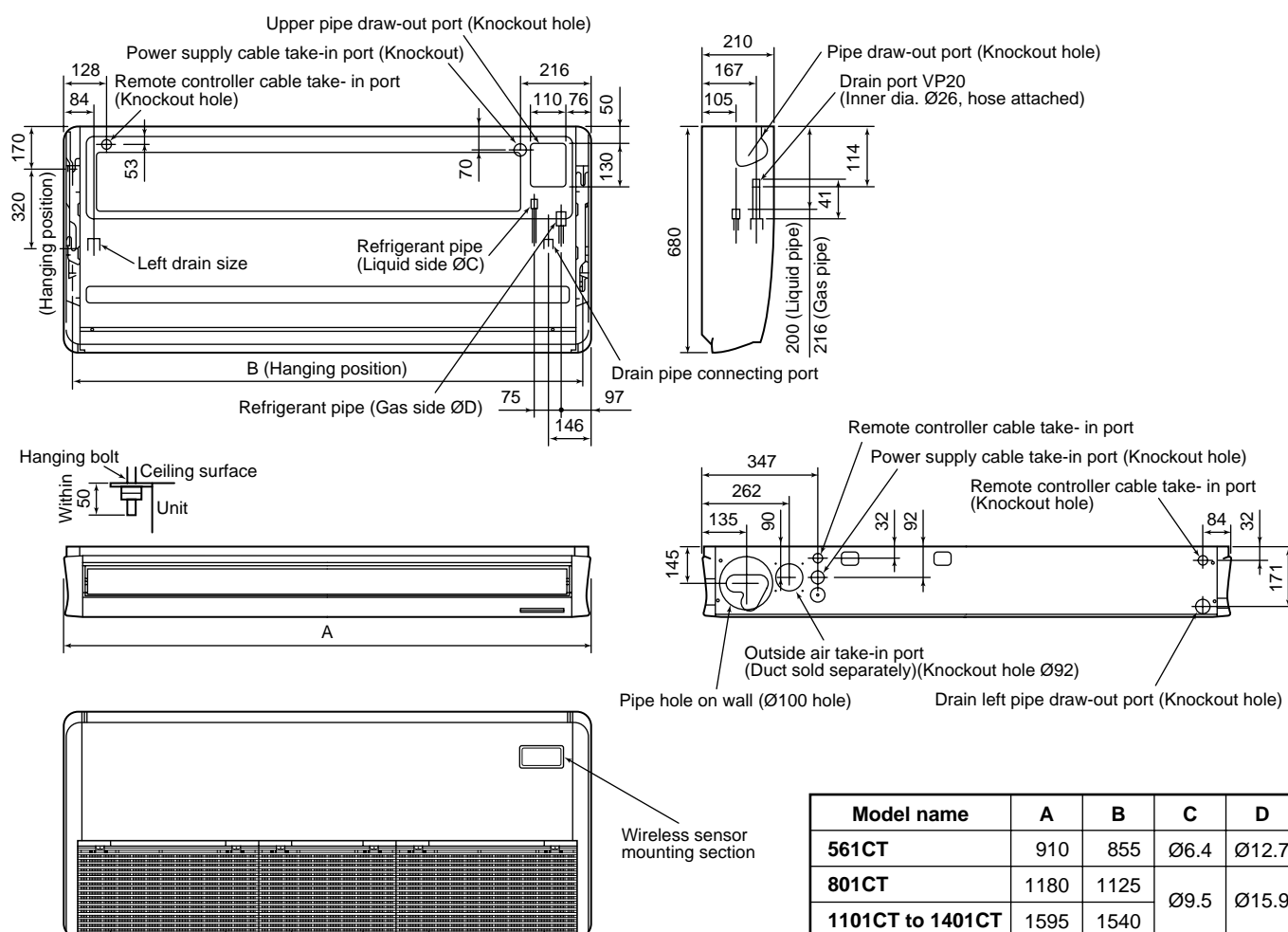
2 SELECTION OF INSTALLATION PLACE

External view

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.



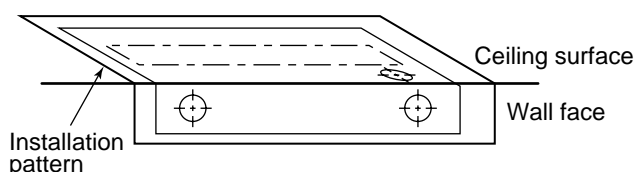
Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.

- If the ceiling has already been set before hanging the main unit, prepare refrigerant pipe, drain pipe, indoor connecting wire, remote controller cord, etc. up to the place where pipe and wire can be connected.
- Check the size of the indoor unit, and match the indoor unit size using the attached installation pattern.

How to use attached installation pattern


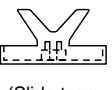
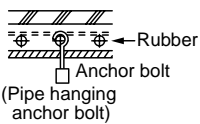
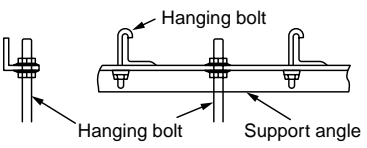


Using the pattern, positioning of the hanging bolt and pipe hole can be performed.

* As an error to some degree may generate on the pattern size due to temperature and humidity, be sure to confirm the size.



Installation of hanging bolts

Use M10 hanging bolts (4 pcs, to be local procure).
Matching to the existing structure, set pitch according to size in the unit external view as shown below.

<p>New concrete slab</p> <p>Install the bolts with insert brackets or anchor bolts.</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p>(Blade type bracket) (Slide type bracket) (Pipe hanging anchor bolt)</p>
<p>Steel frame structure</p> <p>Use existing angles or install new support angles.</p>  <p>Hanging bolt Hanging bolt Support angle</p>
<p>Existing concrete slab</p> <p>Use a hole-in anchors, hole-in plugs, or a hole-in bolts.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>

Draw-out direction of pipe/cable

- Decide installation place of the unit and draw-out direction of pipe and cable.

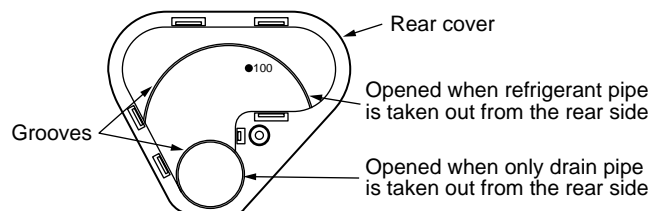
Knockout hole of power cable take-in port

Open the power cable take-in port (Knockout hole) shown in the external view and then mount the attached bushing.

Pipe knockout hole

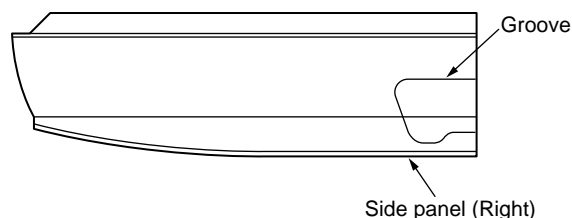
- In case of taking pipe from the rear side**

* Cut off the groove section with a plastic cutter, etc.



- In case of taking pipe from right side**

* Cut off the groove section with a metal saw or plastic cutter, etc.

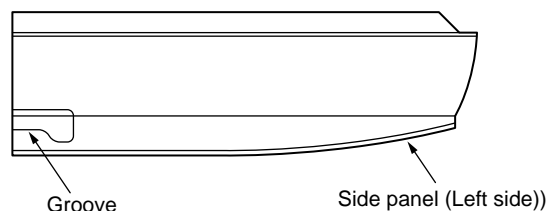


- In case of taking pipe from left side**

Taking pipe from left side is applied only to the drain pipe.

The refrigerant pipe cannot be taken out from the left side.

* Cut off the groove section with a metal saw or plastic cutter, etc.



- In case of taking pipe from upper side**

Taking pipe from upper side is applied only to the refrigerant pipe.

When taking out the drain pipe from the upper side, use a drain up kit sold separately.

Open the upper pipe draw-out port (Knockout hole) shown in the external view.
(Knockout hole of thin plate)

After piping, cut off the attached thermal insulator of the top plate to pipe shape, and then seal the knockout hole.

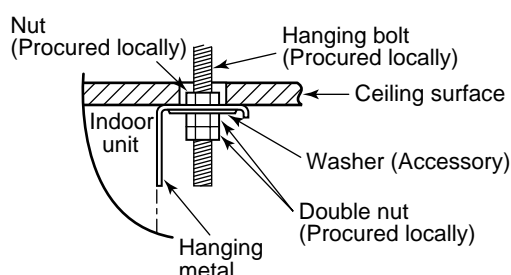
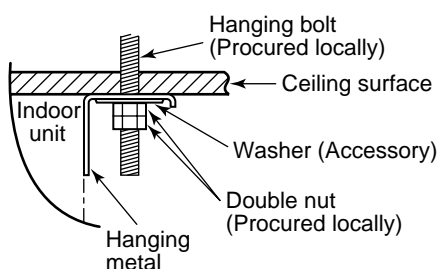
2 SELECTION OF INSTALLATION PLACE

Installation of indoor unit

• Preparation before holding down main unit

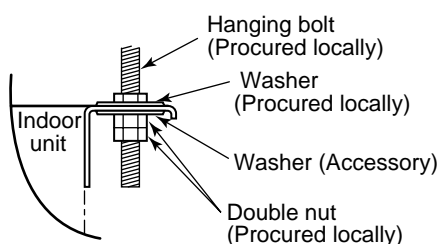
- * Confirm the presence of the ceiling material beforehand because the fixing method of hanging metal when the ceiling material is set differs from that when the ceiling material is not set.

<There is ceiling material>



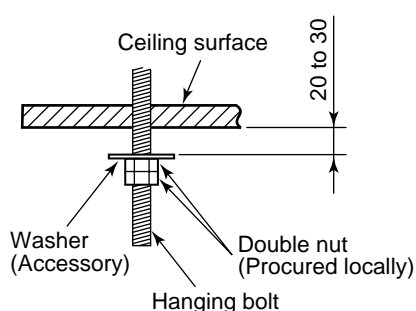
- * Tighten the hanging metal with upper/lower nuts as shown in the figure.

<There is no ceiling material>

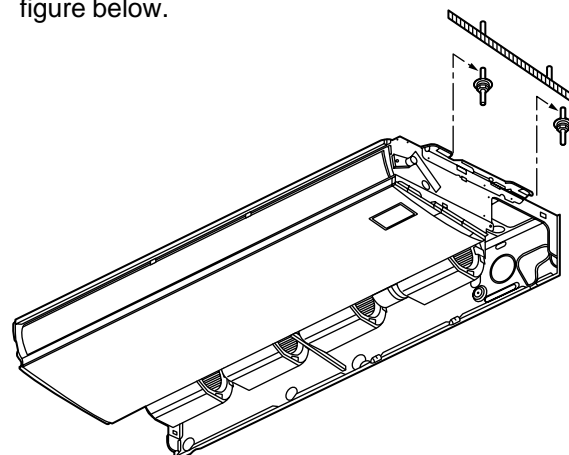


• Holding down main unit

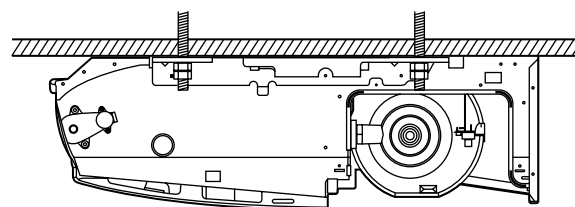
- 1) Attach washer and nuts to the hanging bolt.



- 2) Hang the unit to the hanging bolt as shown the figure below.



- 3) As shown in the figure below, fix the ceiling material securely with the double nuts.



REQUIREMENT

- The ceiling surface may not be horizontal. Be sure to confirm that width and depth directions are level.

Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

- Pull out the remote controller cord together with the refrigerant pipe or drain pipe.
Be sure to pass the remote controller cord through upper side of the refrigerant pipe and drain pipe.
- Do not leave the remote controller at a place exposed to the direct sunlight and near a stove.
- Operate the remote controller, confirm that the indoor unit receives a signal surely, and then install it. (Wireless type)
- Keep 1m or more from the devices such as television, stereo, etc.
(Disturbance of image or noise may generate.)
(Wireless type)

3 DRAIN PIPING WORK

CAUTION

- Following the Installation Manual, perform the drain piping work so that water is properly drained, and apply a heat insulation so as not to cause a dew. Inappropriate piping work may result in water leakage in the room and wet of furniture.

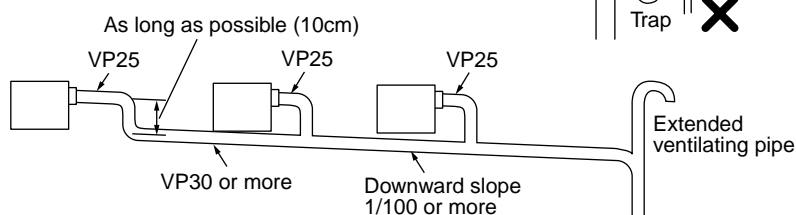
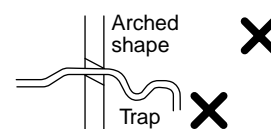
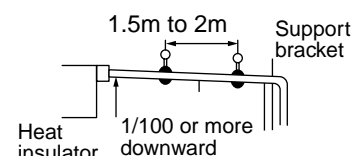
Piping/Heat insulating material

Require the following materials for piping and heat insulating at site.

Piping	Hard vinyl chloride pipe VP20 (Outer dia. : Ø26mm)
Heat insulator	Foam polyethylene : Thickness 10mm or more

REQUIREMENT

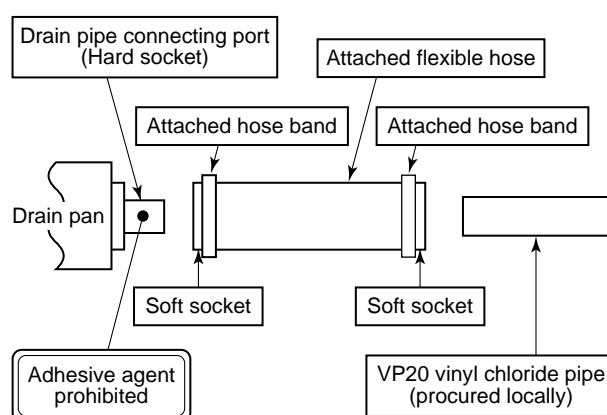
- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dewing.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 20m or less. In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.



<Collective piping>

- Set the collective piping as shown in the right figure.
- Be sure not to apply force to the connecting part of the drain pipe.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit.

For connection with the drain pipe connecting port, be sure to use/fix the attached flexible hose with the hose band, otherwise a damage or water leak is caused on the drain pipe connecting port.



Adhesive inhibited :

Use the attached flexible hose and hose band for connecting the drain hose to the clear drain socket. If applying the adhesive, socket will be damaged and cause water leakage.

Drain up

When not securing down slope on the drain pipe, use a drain up kit sold separately. Also refer to the "Drain up kit installation manual".

The drain pipe can be raised 60cm from the top face of the main unit.

* When using drain up kit, both drain pipe and refrigerant pipe can be taken only from upper side.

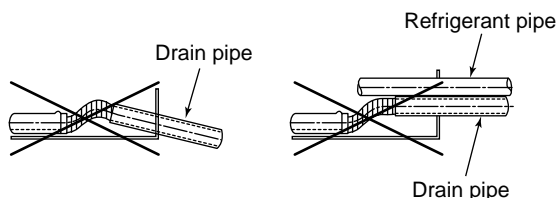
3 DRAIN PIPING WORK

Connection of drain hose

- Insert the attached drain hose into the drain pipe connecting port on the drain pan up to the end.
- Fit the attached hose band to the end of the pipe connecting port, and then tighten it securely.

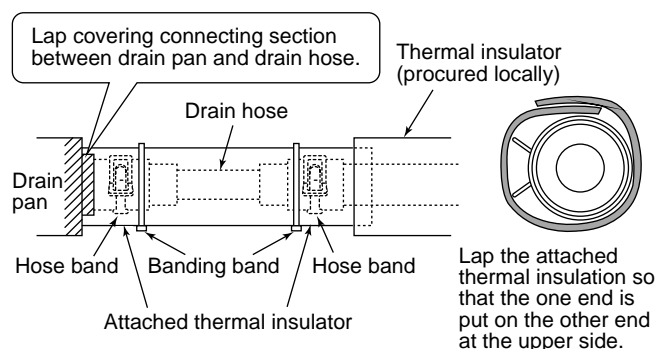
REQUIREMENT

- Be sure to fix the drain hose with the attached hose band, and set the tightening position upward.
- As the draining is the natural water draining, arrange the pipe outside of the unit on the down slope.
- If piping is performed as shown in the figure, drain cannot be discharged.



Thermal insulating process

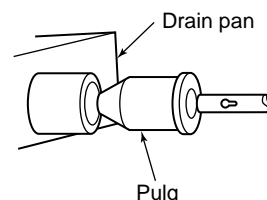
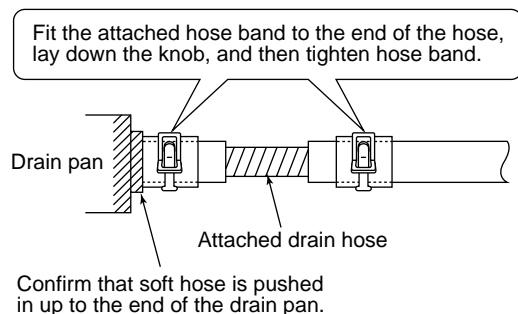
- Using the attached drain hose thermal insulator, lap the connecting section and the drain hose without clearance, and then tighten with two handing band so that thermal insulator does not open.
- Covering the attached drain hose thermal insulator, lap the thermal insulator (procured locally) to the drain pipe without clearance.



* Tighten the banding band so that attached thermal insulator is not pushed excessively.

Connection of drain pipe

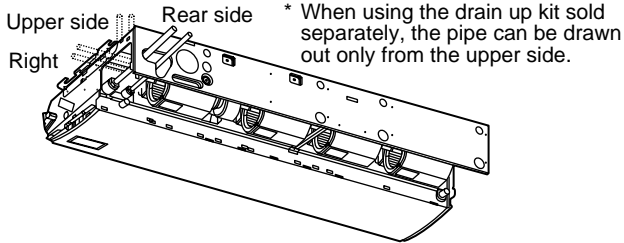
- Connect the hard vinyl chloride pipe (procured locally) to the mounted drain hose which was attached.
- **In case of taking pipe from the left side**
 - In case of taking pipe from the left side, exchange the plug from left to right. Push in the plug of which end is not sharp up to the end.



4 REFRIGERANT PIPING AND EVACUATING

Refrigerant Piping

- The connecting sections of the refrigerant pipes are provided at the positions in the figure below.



- Use copper pipe with 0.8 mm or more thickness.
(In case pipe size is $\varnothing 15.9$, with 1.0mm or more.)
- Flare nut and flare works are also different from those of the conventional refrigerant.
Take out the flare nut attached to the main unit of the air conditioner, and use it.

CAUTION

IMPORTANT 4 POINTS FOR PIPING WORK

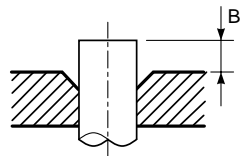
- Remove dust and moisture from the inside of the connecting pipes.
- Tight connection (between pipes and unit)
- Evacuate the air in the connecting pipes using VACUUM PUMP.
- Check the gas leakage. (Connected points)

Permissible Piping Length and Heat

They vary according to the outdoor unit. For details, refer to the Installation Manual attached to the outdoor unit.

Flaring

Insert a flare nut into the pipe, and flare the pipe.
As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.
However, the conventional tools can be used by adjusting projection margin of the copper pipe.



• Projection margin in flaring : B (Unit : mm)

Rigid (Clutch type)

Outer diam. of copper pipe	R410A tool used		Conventional tool used	
	R410A	R22	R410A	R22
6.4 to 15.9	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0

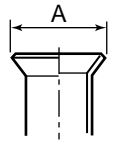
Imperial (Wing nut type)

Outer diam. of copper pipe	R410A	R22
6.4 or 9.5	1.5 to 2.0	1.0 to 1.5
12.7 or 15.9	2.0 to 2.5	1.5 to 2.0

• Flaring diam. meter size : A (Unit : mm)

Outer diam. of copper pipe	A $\begin{smallmatrix} +0 \\ -0.4 \end{smallmatrix}$	
	R410A	R22
6.4	9.1	9.0
9.5	13.2	13.0
12.7	16.6	16.2
15.9	19.7	19.2

- In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size.
The copper pipe gauge is useful for adjusting projection margin size.



Tightening connection

CAUTION

- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

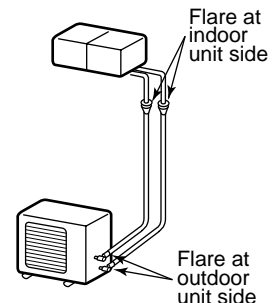
(Unit : N•m)

Outer diam. of copper pipe	Tightening torque
6.4 mm (diam.)	14 to 18 (1.4 to 1.8 kgf•m)
9.5 mm (diam.)	33 to 42 (3.3 to 4.2 kgf•m)
12.7 mm (diam.)	50 to 62 (5.0 to 6.2 kgf•m)
15.9 mm (diam.)	68 to 82 (6.8 to 8.2 kgf•m)

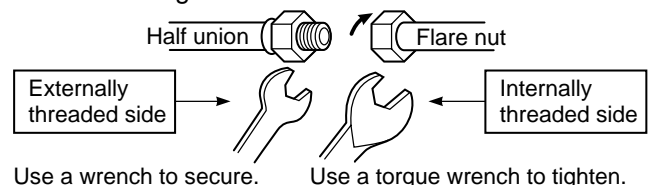
• Tightening torque of flare pipe connections

Pressure of R410A is higher than that of R22.

(Approx. 1.6 times) Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.



Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



4 REFRIGERANT PIPING AND EVACUATING

Piping with outdoor unit

- Shape of valve differs according to the outdoor unit.
For details of installation, refer to the Installation Manual of the outdoor unit.

Air purge

Using a vacuum pump, perform vacuuming from the charge port of valve of the outdoor unit.

For details, follow to the Installation Manual attached to the outdoor unit.

- Never use the refrigerant sealed in the outdoor unit for air purge.

REQUIREMENT

For the tools such as charge hose, etc., use those manufactured exclusively for R410A.

Refrigerant amount to be added

For addition of the refrigerant, add refrigerant "R410A" referring to the attached Installation Manual of outdoor unit.

Be sure to use a scale to charge the refrigerant of specified amount.

REQUIREMENT

- Charging an excessive or too little amount of refrigerant causes a trouble of the compressor. Be sure to charge the refrigerant of specified amount.
- A personnel who charged the refrigerant should write down the pipe length and the added refrigerant amount in the nameplate attached to the service panel of the outdoor unit. It is necessary to troubleshoot the compressor and refrigeration cycle malfunction.

Open the valve fully

Open the valve of the outdoor unit fully. A 4mm-hexagonal wrench is required for opening the valve.

For details, refer to the Installation Manual attached to the outdoor unit.

Gas leak check

Check with a leak detector or soap water whether gas leaks or not, from the pipe connecting section or cap of the valve.

REQUIREMENT

Use a leak detector manufactured exclusively for HFC refrigerant (R410A, R134a, etc.).

Thermal insulation process

Apply thermal insulation for the pipes separately at liquid side and gas side.

For the thermal insulation to the pipes at gas side, be sure to use the material with heat-resisting temperature 120°C or higher.

Using the attached thermal insulation material, apply the thermal insulation to the pipe connecting section of the indoor unit securely without gap.

REQUIREMENT

Apply the thermal insulation to the pipe connecting section of the indoor unit securely up to the root without exposure of the pipe. (The pipe exposed to the outside causes water leak.)

5 ELECTRICAL WORK

WARNING

1. **Using the specified cables, ensure to connect the wires, and fix wires securely so that the external tension to the cables do not affect the connecting part of the terminals.**

Incomplete connection or fixation may cause a fire, etc.

2. **Be sure to connect earth wire. (Grounding work)**

Do not connect the earth wire to gas pipe, city water pipe, lightning rod, or the earth wire of telephone. Incomplete grounding causes an electric shock.

3. **For electric work, strictly follow the Local Regulation in each country and the Installation Manual, and use an exclusive circuit.**

Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

CAUTIONS

- This indoor unit has no power cord.
- If incorrect/incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Be sure to install an earth leakage breaker that is not tripped by shock waves.
If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations on running the wire from outdoor unit to indoor unit (size of wire and wiring method etc.)
- Use the power cord and Inter-connecting cable of specified thickness, type, and protective devices required.

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Never connect 220–240V power to the terminal blocks (A, B, etc.) for control wiring.
(Otherwise, the system will fail.)
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.
The coating may melt resulting in an accident.
- After connecting cables to the terminal blocks, provide a trap and fix cables with the cable clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.


Remote controller wiring

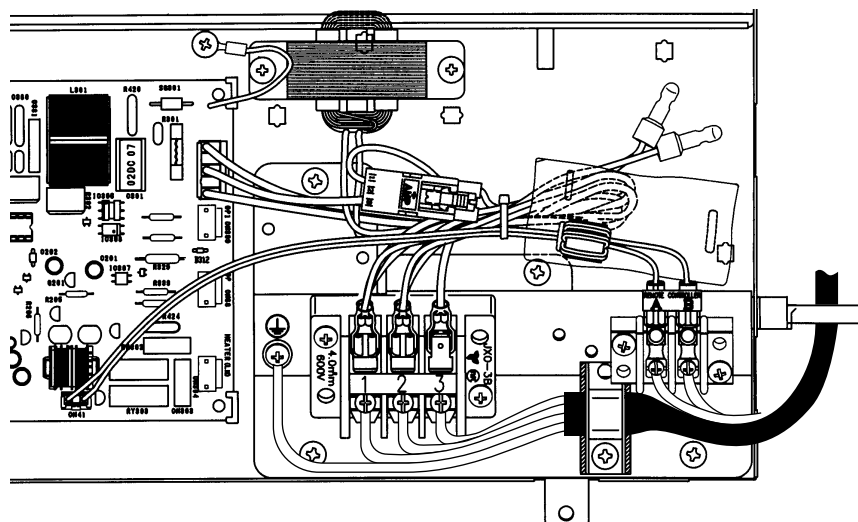
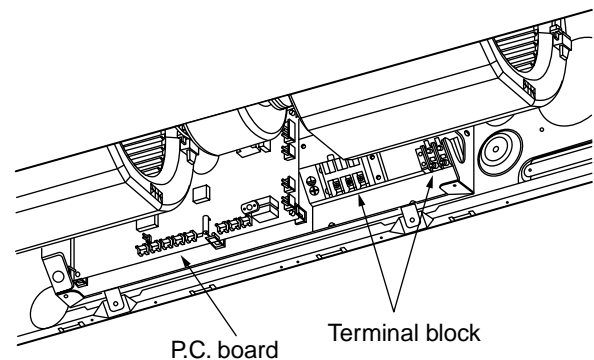
2-core non polarity cable is used for the remote controller wiring.

How to wire

1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit. H07 RN-F or 245 IEC 66 (1.5 mm² or more)
2. Mount a leakage breaker.
3. Insulate the unsheathed redundant cords (conductors) with tape.
4. For inter-unit wiring, do not use a wire jointed to another on the way.
5. Fix the cable with cord clamp.

REQUIREMENT

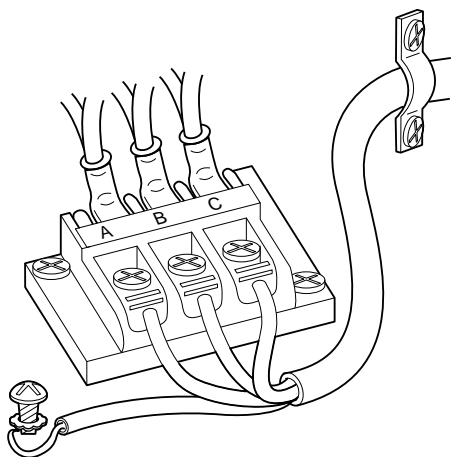
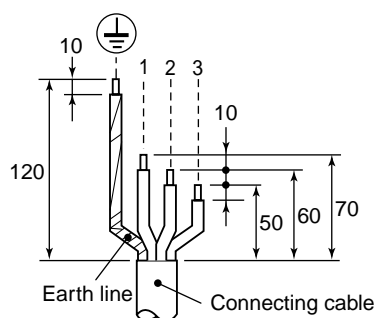
- 
- Diagram showing the internal components of the electric parts box, including the wiring harness and the two screws used for mounting.



Cabling

1. Remove a screw and then remove cover of the electric parts box.
2. Strip wire ends (10 mm).
3. Match wire colors with terminal numbers on indoor and outdoor units' terminal blocks and firmly screw wires to the corresponding terminals.
4. Connect the ground wires to the corresponding terminals.
5. Fix the cable with cord clamp.
6. Fix cover of the parts box and the terminal block surely with the fixing screws.

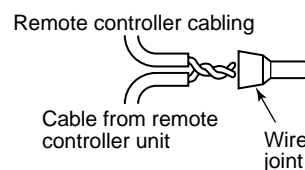
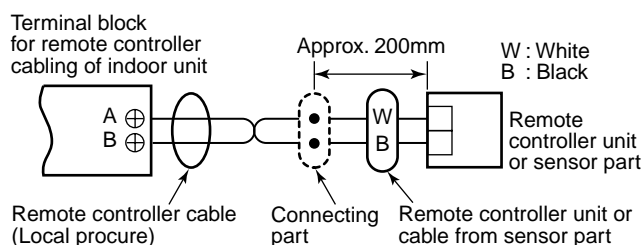
Make a loop on the cable for margin of the length so that the electric parts box can be taken out during servicing.



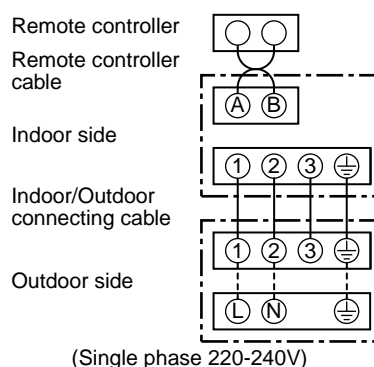
Remote Controller Cabling

- Strip off approx. 14mm the cable to be connected.
 - Non polarity, 2 core cable is used for cabling of the remote controller.
 - Twist cable of the remote controller to be connected with cable of the remote controller unit (or sensor), and press-fit them with a wire joint.
- Wire joints (White: 2 pieces) are included in the attachments to the remote controller (sold separately) or the wireless remote controller kit (sold separately).

Cabling diagram



Wiring diagram



- For details of cabling/installation of the remote controller, refer to the Installation Manual attached to in the remote controller.

6 TEST RUN

Before test run

- Before turning on the power supply, carry out the following procedure.
 - Using 500V-megger, check 1MΩ or more exists between the terminal block 1 to 3 and the earth.
If 1MΩ or less is detected, do not run the unit. Do not apply to the remote controller circuit.
 - Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.

How to execute a test run

Using the remote controller, operate the unit as usual.

For the procedure of the operation, refer to the attached Owner's Manual.

A forced test run can be executed in the following procedure if the operation stops by thermo.-OFF.

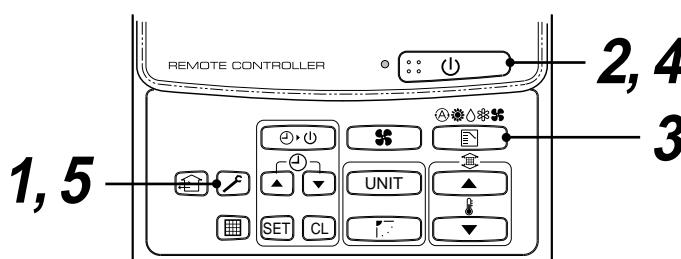
In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

CAUTION


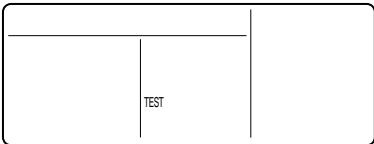
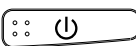
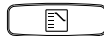
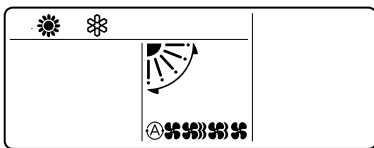
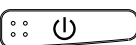


When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on.
It is not a trouble, but is because the setup of the remote controller is being checked.
For the second power-ON time and after, approx. 1 minute is required to start the operation by the remote controller.

NOTE

Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.



In case of wired remote controller

Procedure	Description	
1	Keep  button pushed for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.	
2	Push  button.	
3	Using  button, select the operation mode, [COOL] or [HEAT]. <ul style="list-style-type: none"> Do not run the air conditioner in a mode other than [COOL] or [HEAT]. The temperature controlling function does not work during test run. The detection of error is performed as usual. 	
4	After the test run, push  button to stop a test run. (Display part is same as procedure 1 .)	
5	Push  check button to cancel (release from) the test run mode. ([TEST] disappears on the display and the status returns to a normal.)	

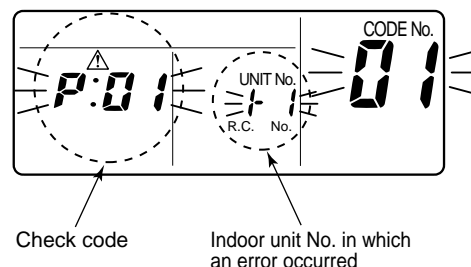
7 TROUBLESHOOTING

Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.

The check code is only displayed during the operation.

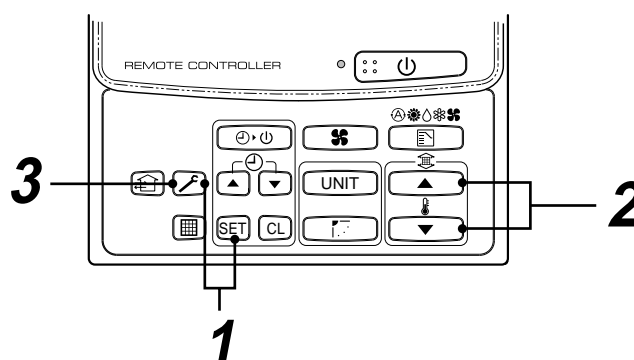
If the display disappears, operate the air conditioner according to the following "Confirmation of error history" for confirmation.



Confirmation of error history

When a trouble occurred on the air conditioner, the trouble history can be confirmed with the following procedure. (The trouble history is stored in memory up to 4 troubles.)

The history can be confirmed from both operating status and stop status.



Procedure	Description
1	<p>When pushing [SET] and buttons at the same time for 4 seconds or more, the following display appears.</p> <p>If [Service check] is displayed, the mode enters in the trouble history mode.</p> <ul style="list-style-type: none"> • [01 : Order of trouble history] is displayed in CODE No. window. • [Check code] is displayed in CHECK window. • [Indoor unit address in which an error occurred] is displayed in UNIT No.
2	<p>Every pushing of [,] button used to set temperature, the trouble history stored in memory is displayed in order.</p> <p>The numbers in CODE No. indicate CODE No. [01] (latest) → [04] (oldest).</p> <p>REQUIREMENT</p> <p>Do not push button because all the trouble history of the indoor unit will be deleted.</p>
3	<p>After confirmation, push button to return to the usual display.</p>

1. Check the troubles according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner.
3. More details of the service code are explained in Service Manual.

8 APPLICABLE CONTROLS

NOTIFICATION

When using the equipment at the first time, it will take a lot of time that the remote controller accepts an operation after power was on. However, it is not a trouble.

• Automatic address

- While automatic addressing, the operation cannot be performed on the remote controller.
- For automatic addressing, Max. 10 minutes (generally, approx. 5 minutes) are required.

• When power will be turned on after finish of automatic addressing;

- It will require Max. 10 minutes (generally, approx. 3 minutes) that outdoor unit starts operation after power was on.

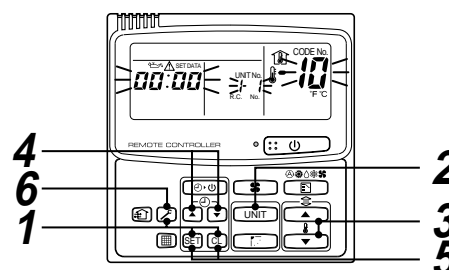
As all the buttons have been set to [Standard] at the shipment, change the setup of the indoor unit if necessary. To change the setup, use the main remote controller (wired remote controller).

* The setup change for wireless remote controller, sub remote controller, or remote controller-less system (Central control remote controller only is provided.) is impossible. In these cases, prepare and mount a separate main remote controller.

Exchange of applicable control setup

Basic operation procedure for setup exchange

Change the setup while operation of the equipment stops.
(Be sure to stop the operation of a set.)



Procedure	Description
1	<p>When pushing SET, CL, and UNIT buttons simultaneously for 4 seconds or more, after a while, the display part flashes as shown in the figure. Check that the displayed item code is [10].</p> <ul style="list-style-type: none"> • If the item code indicates other than [10], push UNIT button to erase the display, and then retry the operation from the first step. (For some time after UNIT button has been pushed, the operation of the remote controller cannot be accepted.) <p>(In a group control, the firstly displayed indoor unit No. becomes the master unit.)</p> <p>(* The display changes according to the indoor unit model.)</p>
2	<p>Every pushing UNIT button, the indoor unit No. in the group control is displayed successively. Select an indoor unit of which setup to be changed.</p> <p>In this time, the position of the indoor unit of which setup to be changed can be confirmed because the fan and the flap of the selected indoor unit work.</p>
3	<p>Using UP, DOWN buttons of set temperature, specify the item code [**].</p>
4	<p>Using UP, DOWN buttons of set timer, select set data [****].</p>
5	<p>Push SET button. In this time, if the display changes from flashing to lighting, the setup completes.</p> <ul style="list-style-type: none"> • To change the setup of an indoor unit other than the selected one, start operation from Procedure 2. • To change the setup of another setup in the selected indoor unit, start operation from Procedure 3. <p>Pushing CL button clears the set up contents which have been already set. In this case, retry from Procedure 2.</p>
6	<p>When the setup finished, push UNIT button. (The setup is determined.)</p> <p>Pushing UNIT button deletes the display and returns the status to normal stop status.</p> <p>(For some time after UNIT button has been pushed, the operation of the remote controller cannot be accepted.)</p>

In case of installation to high ceiling

When the height of the ceiling to be installed exceeds 3.5m, adjustment of air volume is necessary. Set up the high ceiling.

- Set according to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).
- Item code in Procedure specifies [5d].
- Select [Set data] in Procedure from "List of installable ceiling height" in this Manual.
- For the item code in Procedure 3, specify [5d].
- For the set data in Procedure 4, select the setup data of static pressure outside of the machine to be set up from the table below.

(Exchange by wired remote controller)

Set data		
0000	Standard (At shipment)	3.5m or less
0001	High static pressure 1	4.0m or less

To incorporate a filter sold separately

When mounting a filter sold separately, be sure to set up the tap exchange according to the type of filter.

In this case, also follow to the basic operation procedure (1 → 2 → 3 → 4 → 5 → 6).

- For the item code in Procedure 3, specify [5d].
- For the set data in Procedure 4, select the setup data of filter to be incorporated from the table below.

Set data		
0000	Standard filter (At shipment)	Filter sold separately
0001	Zeolite-3G deodorant filter	
0003	High-efficiency filter (65%)	
0006	Deodorant filter Ammonium filter	

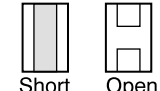
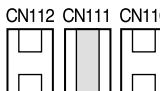


When using wireless remote controller

To exchange the static pressure, there is a method other than the abovementioned method by wired remote controller, which is to shift the short plug on the indoor microcomputer P.C. board as shown in the following table. Adopt this method in case of using a wireless remote controller, etc.

- * However, after exchanging once, be careful to shift the short plug to the standard position (At shipment) in order to return to the standard setup (follow to E2PROM setup) though the setup for high static-pressure 1, high static-pressure 2, or low static-pressure can be arbitrarily performed.

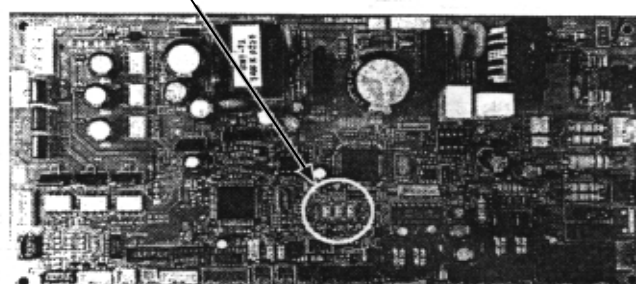
It is necessary to rewrite data from the wired remote controller sold separately in the set data "0000".

- Select by exchange of short plug on indoor microcomputer P.C. board.

Short plug position Short Open	Set data	Filter sold separately
CN112 CN111 CN110 	0000	Standard filter (At shipment)
CN112 CN111 CN110 	0001	Zeolite-3G deodorant filter
CN112 CN111 CN110 	0003	High-efficiency filter (65%)
CN112 CN111 CN110 	0006	Deodorant filter Ammonium filter

If selecting the set data 0006, do not discard the removed short plug, but ask the users to keep it.

- Short plug position (CN112, CN111, CN110 from the left)



8 APPLICABLE CONTROLS

Change of lighting time of filter sign

According to the installation condition, the lighting time of the filter sign (Notification of filter cleaning) can be changed.

Follow to the basic operation procedure

(**1** → **2** → **3** → **4** → **5** → **6**).

- For the item code in Procedure **3**, specify [01].
- For the set data in Procedure **4**, select the setup data of lighting time of filter sign to be changed from the table below.

Set data	Filter sign lighting time
0000	None
0001	150H
0002	2500H (At shipment)
0003	5000H
0004	10000H

To secure better effect of heating

When it is difficult to obtain satisfactory heating due to installation place of the indoor unit or structure of the room, the detection temperature of heating can be raised. Also use a circulator, etc. to circulate heat air near the ceiling.

Follow to the basic operation procedure





(**1** → **2** → **3** → **4** → **5** → **6**).




- For the item code in Procedure **3**, specify [06].
- For the set data in Procedure **4**, select the setup data of shift value of detection temperature to be set up from the table below.

Set data	Shift value of detection temp.
0000	No shift
0001	+1°C
0002	+2°C (At shipment)
0003	+3°C
0004	+4°C
0005	+5°C
0006	+6°C

9 INSTALLATION/SERVICING TOOLS

Tools

Tools	Applicable to R22 model	
Gauge manifold	<input type="checkbox"/>	
Charge hose	<input type="checkbox"/>	
Electronic balance for refrigerant charging	<input type="radio"/>	
Torque wrench (nominal diam. 1/4, 3/8, 1/2, 5/8)	<input type="checkbox"/>	

Tools	Applicable to R22 model	
Flare tool (clutch type)	<input type="radio"/>	
Gauge for projection adjustment	—	—
Vacuum pump adapter	<input type="radio"/>	
Gas leak detector	<input type="checkbox"/>	

○ : Newly prepared (They are special requirements for R407C, separate from those for R22.)

□ : Existing tools are available.

For the details of the tools, refer to the Installation manual of the outdoor unit.

10 MAINTENANCE

Cleaning of Return grille

Preparation :

1. Turn off the main power supply switch (or breaker) before the unit maintenance.
2. Dismount the Suction grille.

Clean the Return grilles with water:

- Wipe down the Suction grille with a sponge or towel moistened with a kitchen detergent. (Do not use any metallic brush for cleaning.)
- **Carefully rinse the Return grille to wash out the detergent.**
- **After rinsing the Return grille with water, dry it in the shade.**

CAUTION

- Do not start the air conditioner while leaving the return grille removed.

Cleaning of Air Filters

- If the air filters are not cleared, it not only impairs the cooling performance of air conditioner but causes a failure in the air conditioner such as water drops.

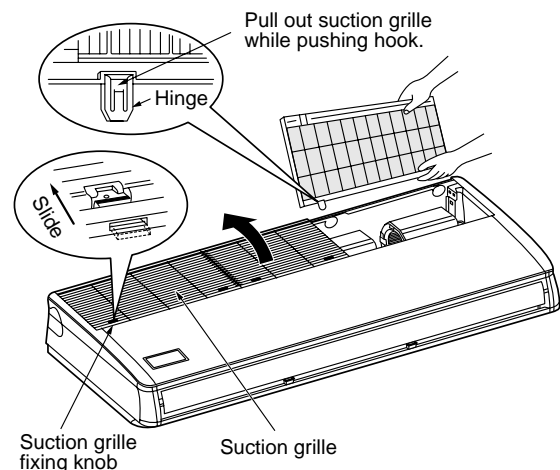
Preparation :

1. Turn off the main power supply switch (or breaker) before the unit maintenance.
2. Dismount the Return grille.

Removal of suction grille

Slide the suction grille fixing knobs (two positions) toward the arrow direction, and then open the suction grille.

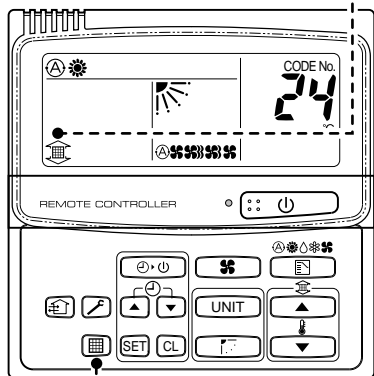
Under the condition of suction grille opened, push the hook section of hinges (two positions) at the rear side, and then pull out the suction grille.



10 MAINTENANCE

Cleaning of air filter

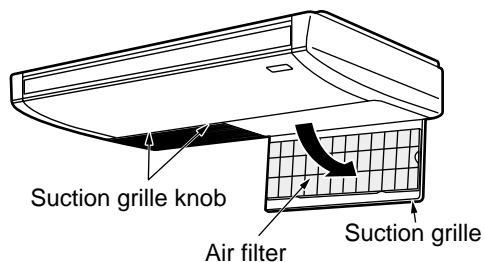
- [FILTER] is displayed on the remote controller, maintain the air filter.
- Clogging of the air filter decreases the cooling/heating effect.



- After cleaning, push [CL].
[FILTER] display disappears.

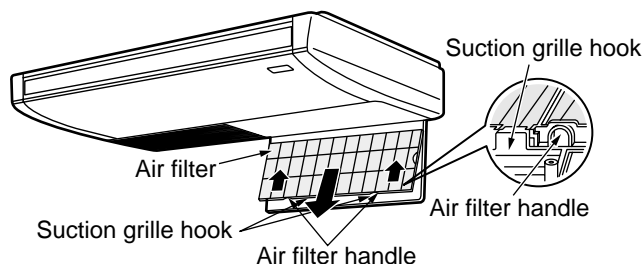
1 Open the suction grille

- Hold "Knob" of the suction grille, push it backward (OPEN), and then open the suction grille softly while holding the suction grille.



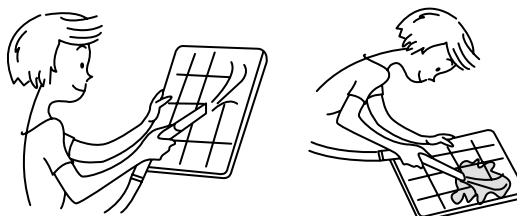
2 Take out air filter.

- Push the handle of the air filter, and remove the hook of the suction grille. Pull out the air filter toward you.



3 Soak up dust with a cleaner or clean with wash.

- If dust is heavy, wash it with tepid water including neutral detergent or water.

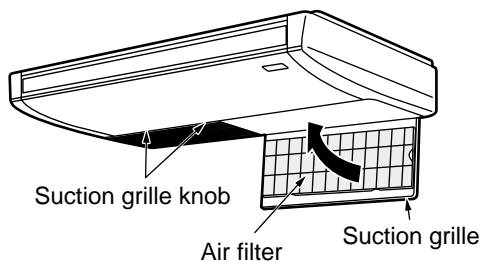


- After cleaning with water, dry it completely in the shade.

4 Mount the air filter.

5 Close the suction grille.

- Close the suction grille, and then fix it securely while sliding [knob] toward you.



6 Push [CL].

- [FILTER] display disappears.

ACCESSORIES

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High-Efficiency Filter 182

High-Efficiency filter (65%)

TCB-UFM11BE/TCB-UFM21BE/TCB-UFM31BE/TCB-UFM41BE

High-Efficiency filter (90%)

TCB-UFH51BE/TCB-UFH61BE/TCB-UFH71BE/TCB-UFH81BE

Deodorant Filter, Ammonium Filter 183

Deodorant Filter

TCB-DF11BE/TCB-DF21BE/TCB-DF31BE/TCB-DF41BE

Ammonium Filter

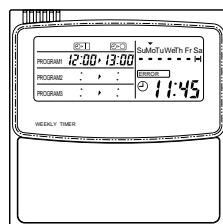
TCB-DF11BE-AM/TCB-DF21BE-AM/TCB-DF31BE-AM/TCB-DF41BE-AM

OWNER'S MANUAL

WEEKLY TIMER FOR AIR CONDITIONER (SPLIT TYPE)

<Program Weekly Timer Type>

RBC-EXW21E



Thank you very much for purchasing TOSHIBA Weekly Timer for Air Conditioner. Please read this owner's manual carefully before using your Weekly Timer for Air Conditioner.

- Be sure to obtain the "Owner's manual" and "Installation manual" from constructor (or dealer).

Request to constructor or dealer

Please clearly explain the contents of the Owner's manual and hand over it.

FEATURES

1. Using the dialogue system, Start/Stop operations three times per one day can easily set with unit of 1 minute.
The program for a week is also set up.
2. To set the holidays (public holidays, consecutive holidays, etc.), the operation reserve can temporarily cancelled.
3. The present time, the day of the week and the operation contents under execution of the program are displayed with 24-hours notation.
4. The output can be forcibly turned on without changing the program.
5. As the backup function is incorporated in this model, the reserve contents of the program are stored in memory during a power failure.

PRECAUTIONS FOR SAFETY

WARNING

WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the weekly timer for air conditioner. If the weekly timer for air conditioner is inappropriate installed by yourself, it may cause water leak, electric shock, fire, and so on.

WARNINGS ABOUT OPERATION

- When you notice something abnormal with the air conditioner (smells like something scorching, poor cooling, etc.), immediately turn off the main switch, the circuit breaker, from the mains to stop the air conditioner, and contact the dealer. If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

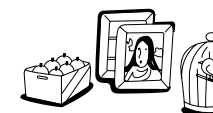
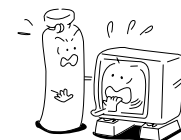
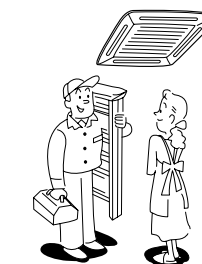
WARNINGS ABOUT MOVEMENT AND REPAIR

- Do not move or repair any unit by yourself. Since there is high voltage inside the unit, you may get electric shock when removing the cover and main unit.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.
- When moving the air conditioner for re-installing at another place, ask the dealer to do it. If it is imperfectly installed, it may cause electric shock or fire.

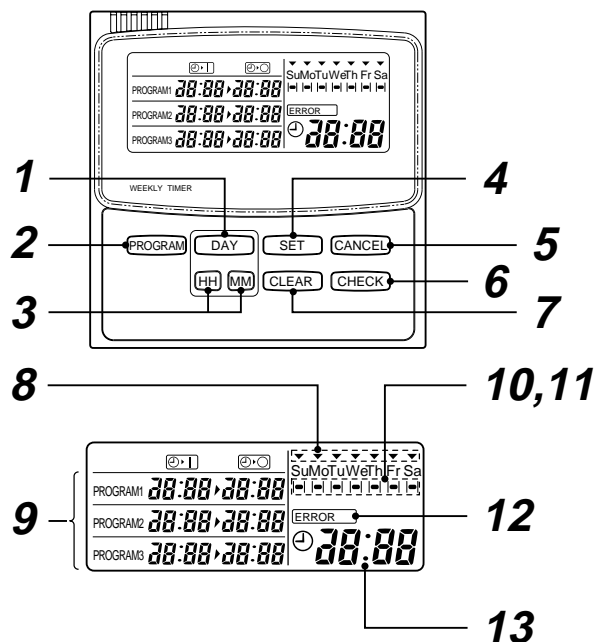
CAUTION

CAUTIONS ABOUT OPERATION

- Carefully read this manual before starting the weekly timer for air conditioner. There are many important things to keep in mind for daily operation.
- Do not use this weekly timer for air conditioner for special purpose such as preserving food, precision instruments, art objects, breeding animals, growing potted plants, etc.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- If the air conditioner was not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety. Disconnect from the power supply prevents the unit from lightning and power supply surge.
- Prevent any liquid from falling into the weekly timer. Do not spill juice, water or any kind of liquid.



NAME AND OPERATION OF EACH PART



1 Day select button

The day of the week is selected.
Each pushing, ▼ mark moves in order of Sunday → Monday → Tuesday → Wednesday → Thursday → Friday → Saturday.

2 Program button

This button is used to set up the contents of the program operation.

3 Hour/Minute button

This button is used to set the present time and ON/OFF time.

4 Timer set button

This button is used to set the day of the week, hour, minute, holiday, and ON/OFF time.

5 Cancel button

This button is used to cancel as the holiday.

6 Check button

This button is used to confirm the contents of the setting items.

7 Cancel button

This button is used to cancel the setting items.

8 Display of the present day of the week (▼ mark)

9 ON/OFF time display

ON/OFF time of the timer operation is displays.

10 Operation reserve indication (■ mark)

The day of the week when the program operation has been set is displayed.

11 Holiday setting indication (■ mark)

The holiday is displayed (Cancel as holiday)

12 Setting error display

13 Present time display

Displays the present time displayed with 24-hours notation.

HOW TO USE THE TIMER CORRECTLY

1. Operation procedure

Power ON
Turn on the power of the air conditioner.

Program weekly timer set up

Setup of the present time
Setup of the present day of the week
Setup of the program operation for a week

2. Turn on the power supply of the air conditioner

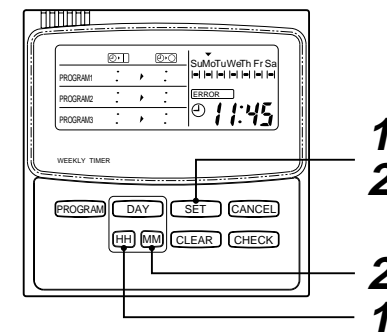
- Turn on the power supply of the air conditioner connected with a program weekly timer. (For cooling and heating, do not turn off the power supply for compressor heating.)

3. Setup of the present time

- Set the present time
(Example: Case that the present time is 11:45.)

1 While push **SET** button push **HH** button to select "hour" of the present time.

- While push **SET** button each pushing **HH** button, change sequentially.
0 → 1 → ... → 10 → ... → 23 → 0
- While keep **SET** button pushed, continuous pushing **HH** button makes fast forward.
(Example: Leave the finger at display of 11, you can set 11 o'clock.)
- When release **SET** button, the hour is set, and **⌚** mark changes flashing to light.



2 While push **SET** button push **MM** button to select "minutes" of the present time.

- While push **SET** button, each pushing **MM** button change sequentially.
00 → 01 → ... → 58 → 59 → 60
- While keep **SET** button pushed continuous, pushing **MM** button makes fast forward.
(Example: Leave the finger at display of 45 you can set 45 minutes.)
- When release **SET** button, the minutes are set, and **⌚** make changes flashing to light.

CAUTION

- The time cannot be changed only when **HH** button or **MM** button pushed.
- If 30 seconds have passed while the button is flashing without pushing **DAY** or **HH** / **MM** buttons, the display returns automatically to the original display (Normal display). In this case, repeat the procedure from the 1st step.

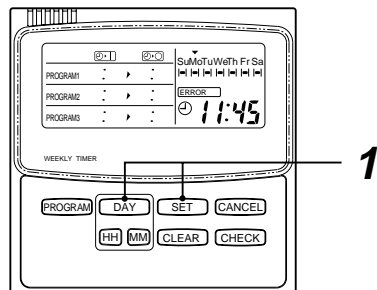
4. Setup of the day of the week

- Set the today of the week.
(Example: Case of Wednesday)

1 While push **SET** button push **DAY** button to select "today" of the week.

- While pushing **SET** button, each push **DAY** button, the display of the present day of the week ▼ flashes, and the display moves in order.

▼ ▼ ▼ ▼ ▼ ▼
Su Mo Tu We Th Fr Sa



CAUTION

- The day of the week cannot be changed only when **DAY** button is pushed.
- If 30 seconds have passed while the button is flashing without pushing **DAY** or **HH** / **MM** buttons, the display returns automatically to the original display (Normal display). In this case, repeat the procedure from the 1st step.

5. How to set program timer operation

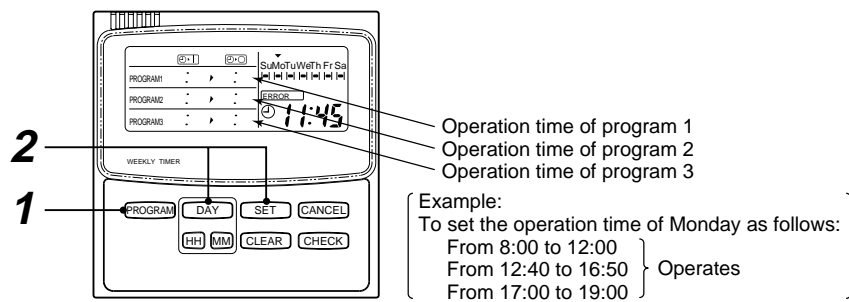
Set the present time and the present day of the week surely, otherwise the program operation is not correctly performed.

This timer can control up to 3 cycle program per day.
(1 cycle or 2 cycles can be also set up.)

The following items can be set to the program operation.

- Setup of [ON] @ [OFF] time ([ON] or [OFF] only cannot be set up singly).

<Name and functions>

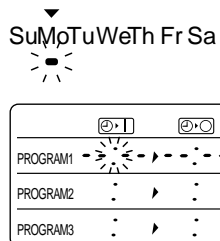


1 First push **PROGRAM** button.

- When pushing **PROGRAM** button, the reserve mark ■ flashes.

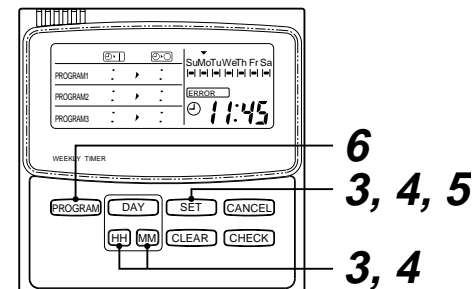
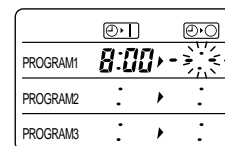
2 Push **DAY** button, select the day for operation and then push **SET** button.

When pushing **SET** button, the flashed reserve mark ■ changes, and ON time of the program 1 flashes at the same time.



3 Set ON time by **HH**, **MM** buttons, and then push **SET** button.

When push **SET** button, the flashed ON time (8:00 in example) change, and OFF time of the program 1 flashes at the same time.



4 Set OFF time by **HH** / **MM** buttons, and then push **SET** button.

When pushing **SET** button, the flashed ON time (12:00 in example) changes, and ON time of the program 2 flashes.

5 Next set up the operation time to the program 2 and 3.

When pushing **SET** button after OFF time of the program 3 has been set, the flashed OFF time (19:00 in example) changes and ON time of the program 1 flashes.

6 Finally, push **PROGRAM** button.

Push **PROGRAM** button within 30 seconds after No. 5 step.

Then, one day timer (Monday in example) is set completely.

ON/OFF is displayed when the present time is included in the range of the set time.

(In the above status, the contents of the program 1 are displayed as the present time is included in the range from ON time to OFF time of the program 1.)

7 Setting to other day, repeat above procedure from 1 to 6.

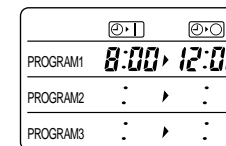
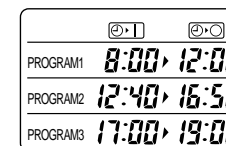
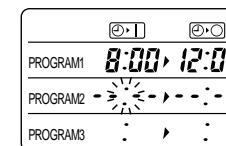
If you need to set the same time as previous setting. Refer to "7. How to copy the program operation time".

CAUTION

- Setup of the program time : 0:00 is treated as 24:00.
(Example) In the following cases, setup are available.

ON time	OFF time
0:00	2:00
22:00	0:00

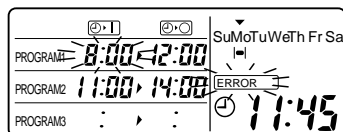
- If 30 seconds have passed while the button is flashing without pushing **DAY** or **HH** / **MM** buttons, the display returns automatically to the original display (Normal display). In this case, repeat the procedure from the 1st step.



6. Set error

If flashing **ERROR** is displayed when the program operation has been set up, correct the time following the procedure below.

- When flashing **ERROR** is displayed, ON time of the failed program flashes.



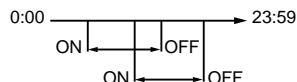
- Push **SET** button to flash the time to be corrected.
- Using **(HH)** / **(MM)** buttons, correct ON/OFF time.
- Push **SET** button. When the setup is correctly performed, **ERROR** display disappears.
- The correction has completed by pushing **(PROGRAM)** button.

CAUTION

- When ON/OFF time is set as follows, **ERROR** is displayed.

- When a part of the operation time makes inroads into a part of another operation time

Example: ON time OFF time
8:00 12:00
11:00 14:00



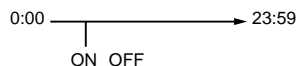
- When OFF time is ahead of ON time

Example: ON time OFF time
12:00 8:00



- When ON time is same as OFF time

Example: ON time OFF time
8:00 8:00



- ON time or OFF time is singly set up

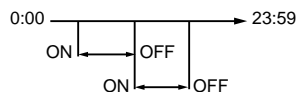
Example: ON time OFF time
8:00 [Is not set]



- The following cases are not set error.

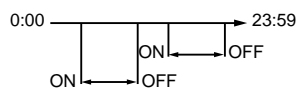
- OFF time of the previous cycle is same as ON time of the next cycle.

Example: ON time OFF time
8:00 12:00
12:00 19:00



- When the next cycle is set to the time before the set time of the previous cycle

Example: ON time OFF time → ON time OFF time
12:40 12:50 12:40 16:50
8:00 12:00 12:40 16:50



Pushing the **(PROGRAM)** button changes the order in order of time.

- When both ON and OFF times are same 0:00

Example: ON time OFF time
0:00 0:00

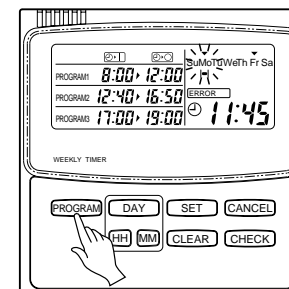
Continuous operation for 24 hours

7. How to copy the program operation time

When setting the program operation, already set program can be copied and set to the other day of the week.

<Example: To copy the operation contents of Monday to Tuesday>

- Push **(CHECK)** button in normal display.
- Push **(DAY)** button and put the operation reserve indication **■** on the day of the week of which the program operation is already set. (Monday in the example)
- Push **(PROGRAM)** button. Present day of the week indication **▼** and Operation reserve indication **■** flash.
- Push **(DAY)** button and put the present day of the week indication **▼** on the day of the week to be copied. (Tuesday in the example) (For continuous copying, push **(SET)** button, and then push **(DAY)** button.)
- Push **(PROGRAM)** button. The operation reserve indication **■** goes on under the copied day of the week.

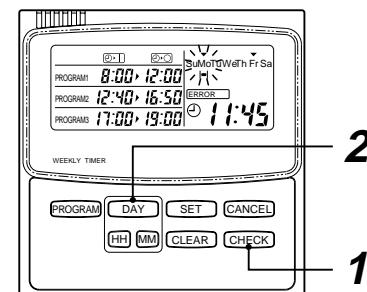


8. How to check the program operation time

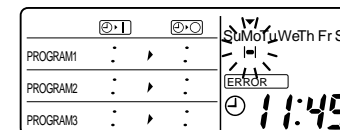
- Push **(CHECK)** button.

<Example: Case to check the program operation time of Wednesday in Monday>

- The operation reserve indication **■** flashes in the normal display status.



- Push **(DAY)** button and put the operation reserve indication **■** on the day of the week to be checked.



- Every pushing **(DAY)** button, the operation reserve indication **■** flashes and the contents of program operation time of the day of the week on which the operation reserve indication **■** has been put on is displayed.



- Push **(CHECK)** button.

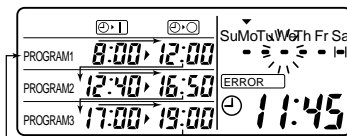
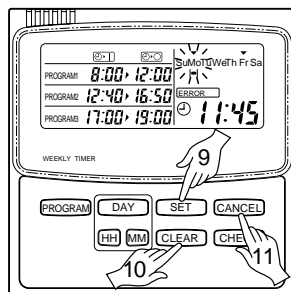
- It turns to be normal indication.

CAUTION

- While reserve indication **■** is flashing, the display does not change even if other buttons are pushed than **(DAY)**, **(CHECK)**, and **(PROGRAM)** button.
- If 30 seconds have passed while the reserve indication **■** is flashing without pushing **(DAY)**, **(CHECK)** or **(PROGRAM)** button, the display returns automatically to the original display. (Normal display)

9. How to change the program operation time

1. Push **PROGRAM** button in the normal display status.
2. Select the required day reserve mark **■** by pushing **DAY** button.
3. Push **SET** button.
4. Each push **SET** button, the flashing part changes in the following figure. Put the indication on the time to be changed.
5. Using **(HH)** / **(MM)** buttons, change the time.
6. Push **SET** button.
7. Push **PROGRAM** button. Then the change operation has completed.



10. How to clear the program operation

• Clear of the day of the week

1. Push **PROGRAM** button.
2. Push **DAY** button and select the reserve mark **■** to be cancelled.
3. Push **CLEAR** button. The program time disappears.
4. Push **PROGRAM** button. The operation reserve indication **■** disappears.

• Clear of a part of the program

1. Push **PROGRAM** button.
2. Push **DAY** button and select the reserve mark **■** on a to be cancelled.
3. Push **SET** button.
4. Push **SET** button again to flash ON or OFF time of the program to be cancelled.
5. Push **CLEAR** button.

Then, a part of the program has been cancelled. At the same time, the remained programs are automatically arranged.

6. Push **PROGRAM** button.

11. How to set up the holiday

• The operation reserve day can be cancelled by setting up the holiday.

1. Push **CANCEL** button. The holiday setup mark **|** flashes.
2. Push **DAY** button and select the holiday setup mark **|** on the day which the holiday is set.
3. Push **SET** button. The flashing holiday setup indication **|** changes on. (**|■**)

• Clearance of [HOLIDAY] setup

1. Push **CANCEL** button.
2. Push **DAY** button and select the holiday setup mark **|** on the day to which the holiday is cancelled.
3. Push **SET** button. The holiday setup mark **|■** disappears and the operation reserve mark **■** appears.

• Explanation of operation

The cancel setting day is temporarily canceled, and from the next day, the cancel setup mark **|■** disappears and the operation reserve mark **■** appears.

CAUTION

- For the day which does not set timer, the cancellation cannot be set.

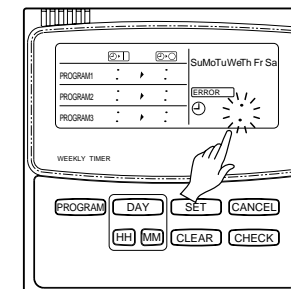
12. Matters to be memorized

1. Power failure

When a power failure occurred and the power supply has been reset, the display of the right figure appears. (A colon ":" flashes.)

• Resuming of operation

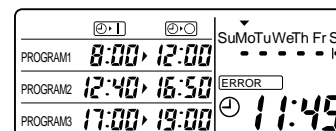
- 1) Turn on the power (breaker) of the air conditioner.
- 2) Start operation by the remote controller.
- 3) Push **PROGRAM** button of the program weekly timer. The flashing colon ":" changes to the clock display in the normal status. In this case, the program is memorized by the backup function. Therefore, it is unnecessary to set the program again.



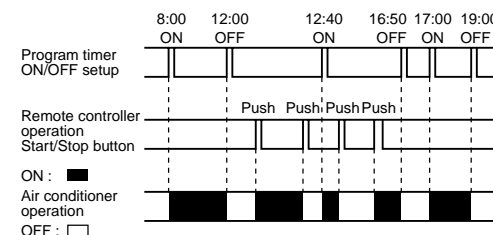
2. Operation of program weekly timer and air conditioner

An air conditioner mounted with a program weekly timer is operated on a remote controller and on the program weekly timer.

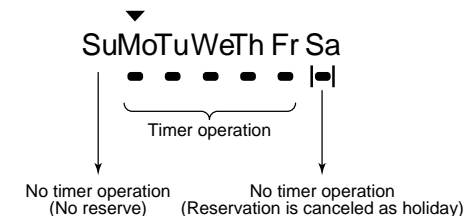
(Example)



1) Operation pattern in a day



2) Operation pattern in a week

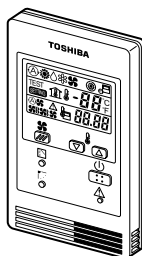


OWNER'S MANUAL

REMOTE CONTROLLER FOR AIR CONDITIONER

<Simple Operation Type>

RBC-AS21E



Thank you very much for purchasing TOSHIBA Remote Controller for Air Conditioner. Please read this owner's manual carefully before using your Remote Controller for Air Conditioner.

- Be sure to obtain the "Owner's manual" and "Installation manual" from constructor (or dealer).

85464189557000

PRECAUTIONS FOR SAFETY

WARNING ⚠

WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the remote controller. If the remote controller is inappropriate installed by yourself, it may cause, electric shock, fire, and so on.

WARNINGS ABOUT OPERATION

- When you are aware of something abnormal with the air conditioner (smells like something etc.), immediately turn off the main power supply switch or circuit breaker, from the mains to stop the air conditioner, and make contact with the dealer. If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

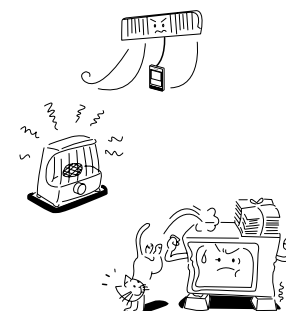
WARNINGS ABOUT MOVEMENT AND REPAIR

- Do not repair any unit by yourself.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.

CAUTION

CAUTIONS ABOUT OPERATION

- Carefully read this manual before starting the air conditioner. There are many important things for the safety and the correct usage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- When the air conditioner was not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety. Disconnect from the power supply prevents the unit from lightning and power supply surge.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.

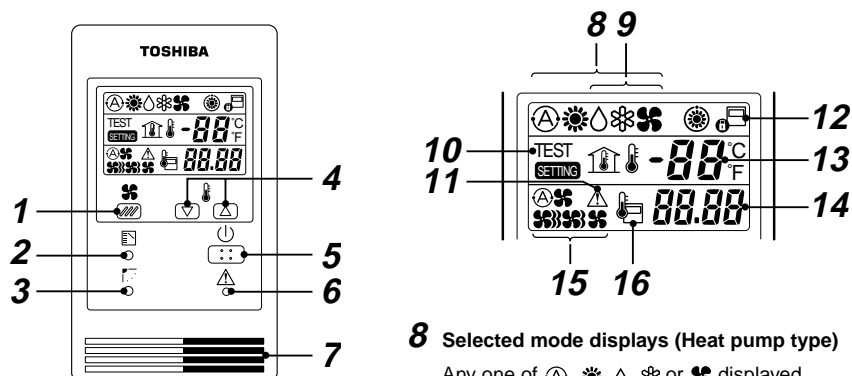


RBC-AS21E

NAME AND OPERATION

- For Cooling Only type, and are not displayed on LCD.
- Max. 8 indoor units can be operated by a remote controller.
- Once setting the operation items, you can operate the previous condition by pushing button only.

<The following display is for explanation, so it differs from the real display.>



1 Fan Speed button

2 Operation mode button

3 Swing/Air direction button

The flap angle is changed.

4 Temperature Setup button

Every pushing button, temperature rises by 1°C.

Every pushing button, temperature decrease by 1°C.

5 [Start/Stop] button

6 Check button (Used in servicing)

- Do not use this button usually.

7 Remote control temperature sensor

Usually controlled by the indoor unit sensor, it can be changed to the remote controller. For details, contact the shop which you purchased the air conditioner. (When using a group control method, do not use the remote controller sensor.)

8 Selected mode displays (Heat pump type)

Any one of , , , or displayed.

While is displayed, the indoor fan stops or the mode is Low speed mode.

9 Selected mode displays (Cooling only type)

Any one of , or is displayed.

10 TEST is displayed during Test Run.

11 (CHECK) is displayed when the protective device worked or trouble occurred.

12 is displayed during the operation.

If the remote controller setting is prohibited by the central remote controller, flashes when [Start/Stop], [Operation Select] or [Temp. Setup] button is pushed and change is not accepted.

13 The setup temperature is displayed.

14 Warning code is displayed when a trouble occurred.

15 Selected fan speed, , , or displays.

16 is displayed when the remote controller sensor is used.

- When turning on the power switch of the simple operation type remote controller at the first time, flashes. While is displayed, the automatic model check is operating. Operate the remote controller after has disappeared.

HOW TO OPERATE AIR CONDITIONER

COOL/HEAT AUTO, HEAT, DRY, COOL, FAN

1 Power supply

Turn on the power supply of the air conditioner 12 hours before starting the operation.

2 Push button.

3 Push button () to select fan speed.

When selecting AUTO, fan speed is automatically changed.
(During FAN mode, the air speed is not.)

4 Push either or set to Auto.

<Recommended temperature>

- During FAN mode, the temperature cannot be set up.

5 Stop

Push button.

When stopping the unit by the remote controller, the fan of the outdoor unit, the fan or the outdoor unit may keep operating for a while even if the compressor of the outdoor unit has stopped.

- When the unit cannot be stopped by the remote controller.

Turn off the main power switch or the leakage breaker, and then contact the shop which you purchased the unit.

- In heating, if the room is not enough heated with FAN , select FAN or .

- As the temperature sensed by the temp. sensor periphery of the suction port of the indoor unit, it differs from in the room according to the installation state. Set the temperature considering the setup value as the standard temperature in the room.

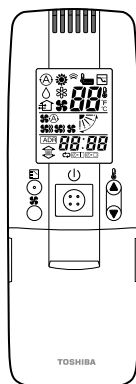
Automatic Cool/Heat

When all indoor units in the identical refrigerant system are controlled as a group and when all indoor units are installed in the same room, the cooling or heating operation is automatically performed with the difference between the setup temperature and the room temperature.

OWNER'S MANUAL

Wireless Type

RBC-AX22CE



Thank you very much for purchasing TOSHIBA Remote Controller for Air Conditioner. Please read this owner's manual carefully before using your Remote Controller for Air Conditioner.

- Be sure to obtain the "Owner's manual" and "Installation manual" from constructor (or dealer).

Request to constructor or dealer

Please clearly explain the contents of the Owner's manual and hand over it.

PRECAUTIONS FOR SAFETY

WARNING

WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the remote controller. If the remote controller is inappropriate installed by yourself, it may cause, electric shock, fire, and so on.

WARNINGS ABOUT OPERATION

- When you are aware of something abnormal with the air conditioner (smells like something etc.), immediately turn off the main power supply switch or circuit breaker, from the mains to stop the air conditioner, and make contact with the dealer. If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

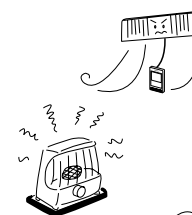
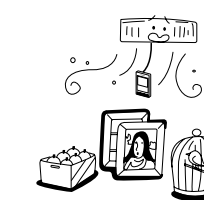
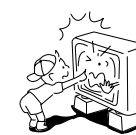
WARNINGS ABOUT MOVEMENT AND REPAIR

- Do not repair any unit by yourself.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.

CAUTION

CAUTIONS ABOUT OPERATION

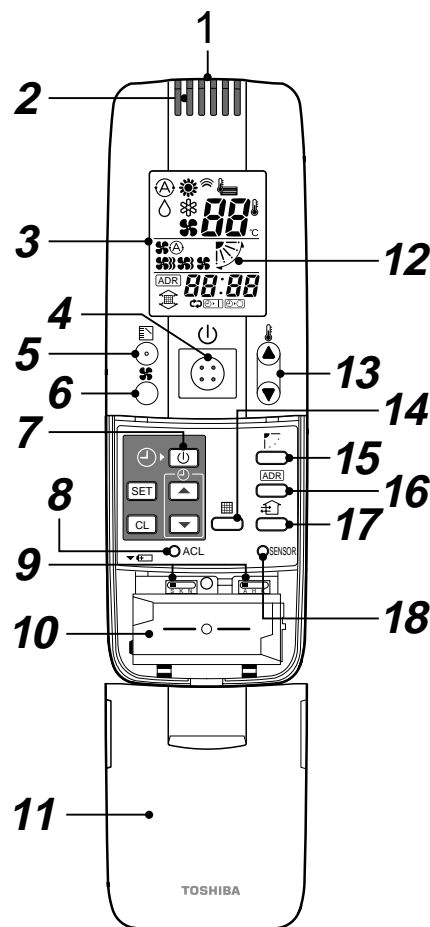
- Carefully read this manual before starting the air conditioner. There are many important things for the safety and the correct usage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- When the air conditioner was not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety. Disconnect from the power supply prevents the unit from lightning and power supply surge.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.



NAME AND OPERATION

Remote Controller

- Max. 8 indoor units can be operated by a remote controller as a group.



1 Transmitting part

2 Remote controller sensor
The peripheral temperature is sensed when the sensor button is pushed to remote controller side.

3 Mode display section

The operation mode is displayed.

4 Start/Stop button

Pushing this button starts, and pushing again stops the unit.

5 Mode Select button

Pushing this button selects an operation mode.

6 Air volume button

7 Time Setup button

This button is used when the timer is setup.

8 Reset button

This button is used after replacement of battery or selection of slide switch.

9 Slide switch

10 Part storing batteries

11 Cover

Slide the cover holding its both sides.

12 AUTO flap display differs according to the installed unit.

13 Setup Temp. button

Every pushing this button, temperature rises by 1°C.
Every pushing this button, temperature lowers by 1°C.

14 Filter button

The remote controller is not operated even if this switch is pushed.

15 Swing/Air direction button

16 Address button

17 Ventilation button

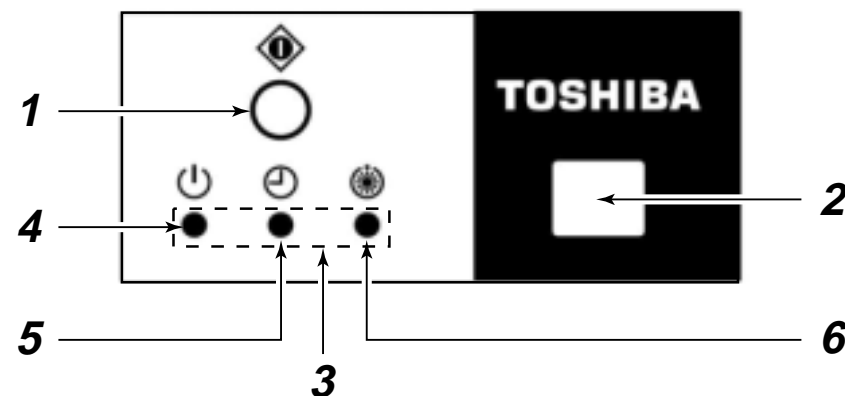
The remote controller is not operated even if this switch is pushed.

18 Sensor button

This button is used when selecting the temp. sensor at the remote controller side. At the shipment from the factory, this button is set to the temp. sensor at the indoor unit.

- The signal receiving part is mounted to the ceiling panel.

Signal Receiving Part



1 Temporary operation button

2 Signal receiving part

The signal sent from the remote controller is received.

3 Display lamp

One of displays flashed while a trouble occurs. When the display lamp flashes, refer to "Before asking of repair".

4 ⏻ lamp

This lamp goes on during operation.

5 ⌚ lamp

This lamp goes on while the timer is reserved.

6 ⚙ lamp

- In heating operation this lamp in the following cases;
The operation has started.
The temp. controller has worked.
The unit is under defrost operation.
- This lamp flashes while a trouble occurs.

- If "pi, pi" sound is heard, the MODE lamp of the display lamp goes on, and the ⌚ lamp and ⚙ lamp flash alternately, the operation is not performed with the desired mode.

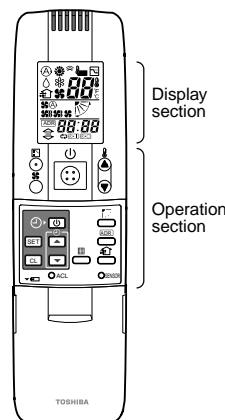
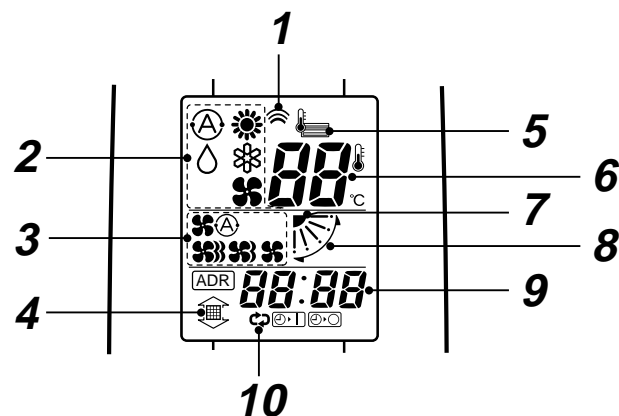
HOW TO SET THE FAN SPEED

Display Section

All indicators are shown in the right and the lower figures for the explanation.

Only selected contents are display in actual operation.

- When turning on the leakage breaker at the first time 3 minutes later, [SET DATA] flashes about for 1 minute on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. Accordingly, wait for 1 minute after [SET DATA] display has disappeared, and then use the remote controller.



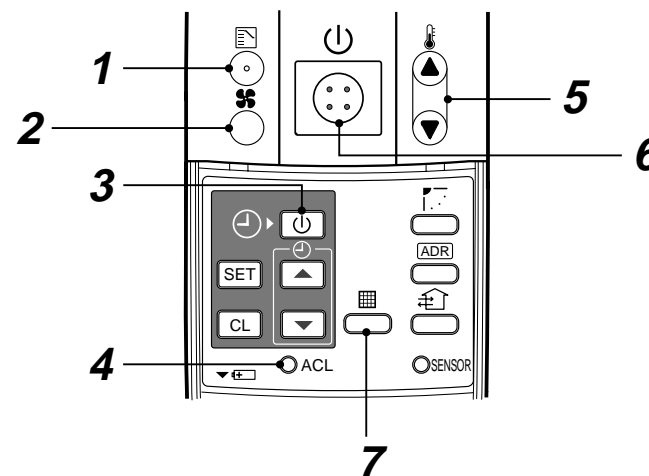
- Transmitting indication**
Displayed while operating the switches of the remote controller.
- Mode display**
The selected operation mode is displayed.
- Fan mode select display**
The selected fan mode is displayed.
(AUTO)
(HIGH)
(MED.)
(LOW)
- Filter display**
If "FILTER " is displayed, clean the air filter.
- CHECK display**
Displayed while the protective device works or a trouble occurs.

- Set up temperature display**
The selected set up temp. is displayed.
- Flap position display**
- SWING display**
Displayed during up/down movement of the flap.
- Timer time display**
Time of the timer is displayed.
(When a trouble occurs, the check code is displayed.)
- Timer SETIN setup display**
When pushing the Timer SET button, the display of the timer is selected in order of [OFF] → [OFF] repeat OFF timer → [ON] → No display.

Operation Section

Push each button to select a desired operation.

- The details of the operation needs to be set up once, afterward, the air conditioner can be used by pushing button only.



- Operation select button**
Selects desired operation mode.
- Fan mode select button**
Selects a fan mode.
- Timer set button**
TIMER SET button is used when the timer is set up.
- Check button**
CHECK button is used for check operation. During normal operation, do not use this button.
- Temperature set button**
Adjusts required room temperature. Set required set temperature by pushing or .
- Start/Stop button**
When the button is pushed, operation starts, and it stops by pushing the button again. When the operation stops, the operation lamp and all displays disappear.
- Filter reset button**
Resets (Erases) "FILTER " display.

OPTION :

Remote controller sensor

Usually the TEMP. sensor of the indoor unit measured a temperature. A temperature around the remote controller can also be measured. For details, contact the dealer from which you have purchased the air conditioner.

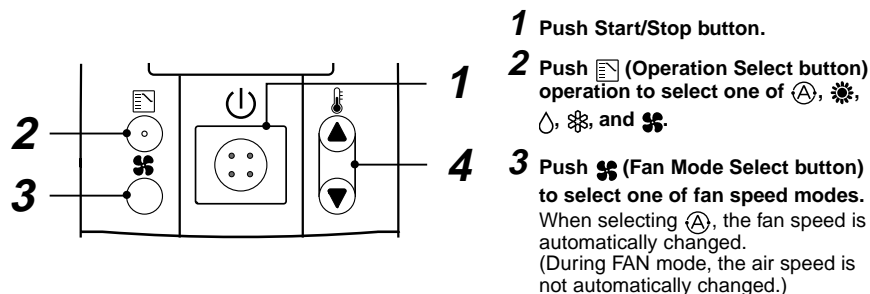
HOW TO OPERATE THE UNIT

Cool/Heat AUTO, Heat, Dry, Cool, Fan

Power supply

Turn on the power of the wireless remote controller 12 hours before starting the operation.

- After the power supply has been turned on, the operation of the remote controller is not accepted for approx. 1 minute. It is not a failure.
(The sensor receives the signal once, but the received contents are cleared.)



5 Stop

Push Start/Stop button.

When using the remote controller to stop the unit, the outdoor unit fan may keep operating for a while even if the compressor of the outdoor unit has stopped.

- In heating operation, if the room is not comfortably heated with FAN , select FAN or .

Although they are displayed, the function may not be provided according to the used indoor unit. (Fan speed is constant.)

- When the unit cannot be stopped by the normal operation

Turn off the power switch or leakage breaker, and then contact the shop which you purchased the unit.

Automatic cool/heat

When all indoor units in the identical refrigerant system are controlled as a group, the cooling/heating operation is automatically performed with the difference between the setup temperature and the room temperature.

Dry operation

- There is no dry function according to the used indoor unit even if DRY is displayed on the display section of the remote controller. (Same to Cooling operation)
- When the room temperature approaches the setup temperature, running/stop operations are automatically repeated.
- In order not to return humidity to the room as possible, the mode of indoor fan enters LOW mode when the operation has stopped.
- The fan speed cannot be adjusted according to the used indoor unit or status of the room temperature.
- The DRY mode cannot be used according to the used indoor unit when the outdoor temperature is 15°C or lower.

HOW TO OPERATE THE TIMER

- After setting of the timer, set the remote controller at a position where the signal can reach the sensors (indoor unit body).
(The signal of the timer operation is sent from the remote controller.)
- Set up the timer during display of the operation mode.

<Use example>

How to use OFF timer

(Ex.) To stop the unit 30 minutes after

- When pushing the timer once, and the time flash on the remote controller.
- Push TIME or to set the time to 0.5.
- Push and the go on timer.

How to use the repeat timer

(Ex.) To stop the air conditioner every time after 2.5 hours has passed

- When pushing the timer twice, , and the time flash on the remote controller.
- Push TIME or to set the time to 2.5.
- Push and the , go on timer.

The works, and the operation stops after 2.5 hours. When pushing (Start/Stop) button again to operate the unit, the operation stops after 2.5 hours.

How to use ON timer

(Ex.) To operate the unit 8 hours after

- When pushing the timer three times, and the timer flash on the remote controller.
- Push TIME or to set the time to 8.0.
- Push The operation mode display disappears, and then time and the go on.

To stop the timer operation

To stop the timer operation
Push button. Then the timer display disappears.

Use in the following cases	During display
To stop the air conditioner after the previously set time has passed	
To stop the air conditioner every time after the previously set time has passed	
To operate the air conditioner after the previously set time has passed	

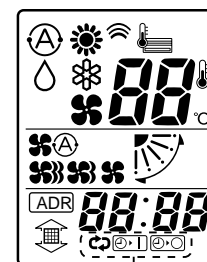
Timer time

Every pushing , the setup time increases by 0.5 hour (30 minutes).
The maximum time to be set is 72.0 hours.

Every pushing , the setup time decreases by 0.5 hour (30 minutes).
The minimum time to be set is 0.5 hours.

Timer display

Every pushing , the display changes as follows;




No display





HOW TO ADJUST AIR DIRECTION

- Never move the flap (Air direction up/down adjusting plate) which is operated on the remote controller with hands except a case of cleaning of the flap.
- While the unit stops, the flap (Air direction up/down adjusting plate) directs downward automatically.
- During preparation of heating, the flap (Air direction up/down adjusting plate) directs upward. The swinging operation starts after heating preparation status has been cleared. However, swinging is displayed on the AUTO flap display of the remote controller even if the heating operation is being prepared.



How to set up the air direction

Every pushing  button during operation, the air direction changes.

How to start swinging

When pushing  button, set the direction of the flap (Air direction up/down adjusting plate) to the lowest position, and then push  button again, the swinging is displayed and the air direction automatically changes upward/downward.

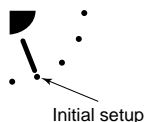
How to stop swinging

Pushing  button once again during swinging of the flap stops the flap at the desired position. Then, when pushing  button, the air direction can be set to position from the uppermost position.

- In cooling or dry operation, the flap does not stop when the flap directs downward. If doing so, the flap stops at the 3rd position from the uppermost position.

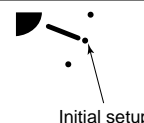
In heating operation

Direct the flap (Air direction up/down adjusting plate) downward, otherwise the hot air may not reach at the foot.

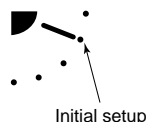


In cooling/dry operation

Direct the flap (Air direction up/down adjusting plate) upward, otherwise dewdrops may adhere or drip down to near of the discharge grille.



In air blowing operation



In all operation modes

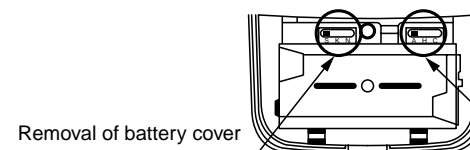


Display when swinging stopped



SLIDE SWITCH

- Do not change setting of the slide switch because a malfunction occurs by other settings.
- Before usage, check the slide switch is set to the position as follows;



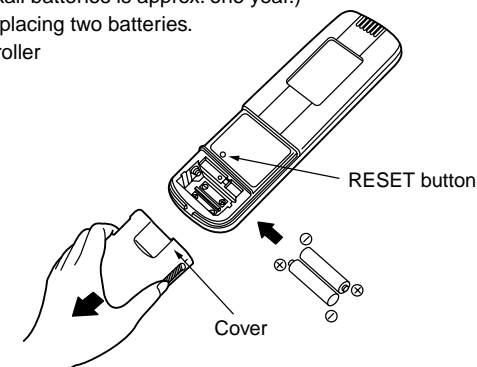
	Corresponding model for change of flap
Slide switch position	
Flashing position on remote controller	HIGH MED. Swing

Operation mode display of remote controller
Slide switch position

HOW TO INSERT THE BATTERIES

1. Holding the both sides of the cover and remove it by sliding downward.
2. Correctly insert 2 AAA alkali batteries matching + and - polarities with indications.
3. Push RESET button with something tipped and attach the cover.

- Replace the batteries when the display section of the remote controller is difficult to be read, or when the signal cannot be sent if you are not close to the sensor. (The standard replacement time of the alkali batteries is approx. one year.)
- Use the same type of new batteries for replacing two batteries.
- In case when you do not the remote controller for a long time, remove the batteries.

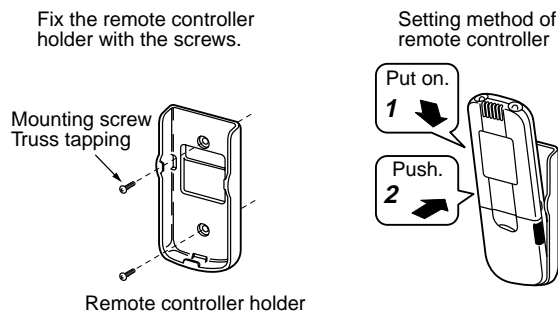


HOW TO HANDLE THE REMOTE CONTROLLER

- Direct the transmitter of the remote controller toward the sensor (indoor unit body). When the signal is normally received, "Pi" sound is heard once. ("Pi, pi" sounds are heard only when the operation has started.)
- The standard distance which the signal can be received is approx. 7m. The distance differs a little according to the capacity of the battery, etc.
- Be careful there is not something to block the signal between the sensor (indoor unit body) and the remote controller.
- Do not put the remote controller on the place exposed to the direct sunlight or air from the air conditioner or near the stove, etc.
- Do not drop, throw, or clean with water the remote controller.
- The signal may be accepted in a room where the electronic instantaneous-ON type or inverter type fluorescent light is set. For details, contact the shop which you purchased the air conditioner.

To Use the Remote Controller Setting to Wall, etc.

- Check a signal is received correctly by pushing (⏻) Start/Stop button at the position to be fixed.
- To take off remote controller, pull it toward you.



HOW TO USE THE REMOTE CONTROLLER CORRECTLY

- **Set the remote controller so that it is not excessively far from the sensor (indoor unit), otherwise a malfunction is caused.**
Be sure to set the remote controller in the same room where the sensor (indoor unit) is installed.
- **Direct the remote controller toward the sensor (indoor unit) for operation.**
When a signal is correctly received, "Pi" sound can be heard.
- **Avoid to set the remote controller at a place where it is covered with curtain, etc.**

ADDRESS

When the multiple indoor units corresponding to the wireless remote controller are installed in the same room, an address can be set up to prevent an interference.

Matching the address switch of the sensor with number of the remote controller address, Max. 6 indoor units can be controlled by the corresponding remote controller individually.

The address switch for receiving the signal is prepared to the sensor (inside of panel or indoor unit) and the address switch for sending the signal is prepared to the remote controller. For details, contact the shop which you purchased the air conditioner.

How to Check the Address

When pushing [ADR] button on the remote controller, the present address is displayed on the display section of the remote controller. If this address matches with the address of the sensor (inside of panel or indoor unit), a buzzer sounds. (When ALL is displayed, buzzer sound is necessarily heard.)

When ALL is displayed, the air conditioner can be operated regardless of any address of the sensor (inside of the indoor unit). Send the signal by directing the remote controller toward the sensor (panel or indoor unit body) to be handled.

How to Match the Address

Setup to remote controller address

1. When keeping [ADR] pushed for 4 seconds or more, [ADR] lamp goes on at the display section of the remote controller and the present address is displayed with flashing.
2. Every pushing [ADR], the address is exchanged as ALL → 1 → 2 → 3 ... → 6 → ALL. Match one of them with the address switch of the indoor unit sensor to be handled.
3. When pushing [CL], the address display goes on and is displayed for 5 seconds. If the address matches with the address switch of the operation part, the buzzer sounds.

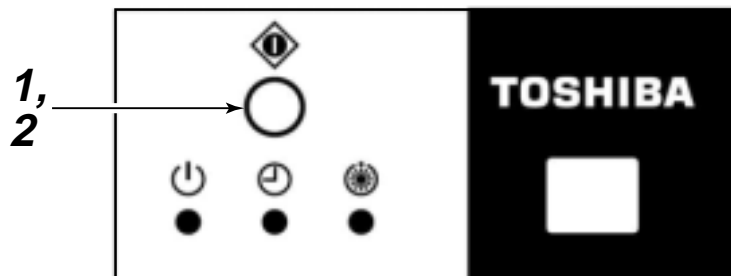
Display of remote controller address	Address <i>ALL</i>	Address <i>1</i>	Address <i>2</i>	Address <i>6</i>
Address switch position of sensor	* Address switch of sensor unit can be set any position.	4-6 1-3 S001 Address select S002 Address	4-6 1-3 S001 Address select S002 Address	4-6 1-3 S001 Address select S002 Address

Turn the knob to the right side for 1 to 3 while to the left side for 4 to 6 of Address select switch S001.

HOW TO PERFORM TEMPORARY OPERATION

In the following cases, operate the air conditioner in emergency by emergency operation of the operation part (inside of panel or indoor unit).

- The battery in the remote controller expired.
- A trouble occurred on the remote controller.
- The remote controller have disappeared.



1 Start

Push temporary operation.

(If starting the operation when the room temperature is 24°C or higher, the mode enters COOL mode. If starting the operation when the room temperature is 24°C or lower, the mode enters HEAT mode.)

2 Stop




Push emergency operation once more.

























CAUTION

- The ON switch of the test run and the ON switch of the test are used for the test run mode in the installation time. Do not use them in the normal time.
- If the "all stop" is selected in the normal/all stop switches, a signal from the remote controller is not accepted.

BEFORE ASKING REPAIR WORK

Before asking a repair work, check the following items.

Phenomenon	Cause	Measures
Check again Operation does not start even if the switch is turned on.	Stopped? or after power failure?	Push Start/Stop of the remote controller.
	Is the power supply of the power switch?	Turn on the power supply switch if not.
	Fuse?	Contact the shop which you purchased the air conditioner.
	Is not the mode ON timer?	Delete the timer operation.
	Is not [ALL OFF] of [Signal Receiving Part] selected?	Set the switch to [Normal position], and stop the operation.
	Is not the battery of the remote controller expired?	Replace the battery.
	Is not the state of the display lamp "Disagreement of  (cool) and  (heat)" or "No  "?"	Change the operation mode.

Phenomenon	Cause
Contact the shop which you purchased the air conditioner	<p><Display lamp flashes.></p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p> <p>  </p>
	<ul style="list-style-type: none"> • It is a communication error between the sensor and the indoor unit, or setup error of the address when the wired remote controller is used.
	<ul style="list-style-type: none"> • A communication error between the indoor unit and the outdoor unit.
	<ul style="list-style-type: none"> • A protective device of the indoor unit works.
	<ul style="list-style-type: none"> • A protective device of the outdoor unit works.
	<ul style="list-style-type: none"> • A trouble occurred on the temperature sensor.
	<ul style="list-style-type: none"> • The compressor of the outdoor unit is protected.
	<ul style="list-style-type: none"> • The test run is performed. Turn off the Trial ON switch.

Please check the above items. If the trouble yet remains, stop the operation, turn off the power switch, and then notify the shop which you purchased the air conditioner of the part No. and phenomenon. Never repair any part by yourself because it is very dangerous. If the display lamp is flashing, also tell of its contents.

Accessory parts

Part Name	Q'ty	Part Name	Q'ty
Remote controller (200mm-cable attached)	1	Spacer	2
Screw M4 x 25	2	Wire joint	2
Wood screw	2	Installation Manual	1

Requirement to install the remote controller

Installation place

- Install the remote controller at a position with height 1 to 1.5m from the floor, where the average temperature in the room can be felt.
- Do not install the remote controller at a place exposed to direct sunlight or direct outside air, such as a side of window, etc.
- Do not install the remote controller at a place behind something or rear side of something where air flow is poor in the room.
- Do not install the remote controller in the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
- Be sure to set the remote controller vertically on the wall surface, etc.

How to select the room temperature sensor

The room temperature sensors are equipped in the indoor unit and remote controller.

One of two sensors works. Usually, the room temperature sensor in the indoor unit is set to work. To select the sensor in the remote controller side, refer to the following procedure.

- Keep **[SET]**, **[UNIT]**, and **[CL]** buttons pushed for 4 seconds or more.

NOTE) The UNIT No. displayed at the first time is the indoor unit address of the master unit in the group control.

NOTE) Do not push **[UNIT]** (select) button.

- Using the temperature setup buttons **[▲]**/**[▼]**, specify the item code (0032).
 - Using the timer buttons **[▲]**/**[▼]**, change the set data from (0000) to (0001).
 - Push **[SET]** button.
 - (OK if the display changes from flashing to lighting)
 - Push **[CL]** button.
- The status returns to the normal status. In this time, **[SET]** is displayed in LCD.

NOTE 1 :

When using two remote controllers, the master remote controller is recognized as **[SET]** sensor though the temperature can be set from either master or sub remote controller.

NOTE 2 :

In a group control, the **[SET]** sensor does not work if the group address is not set to the indoor unit of the master unit.

NOTE 3 :

When using the remote sensor together with the remote controller, do not use the **[SET]** sensor of the remote controller.

How to install remote controller

NOTE 1 : Avoid to twist the remote controller cable with power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

NOTE 2 : Install the remote controller apart from the generation source of noise.

NOTE 3 : When noise is contained to the unit power supply, counter measures such as mounting the noise filter is necessary.

- When using the remote controller as exposed, install it at the wall surface where it can be fixed.

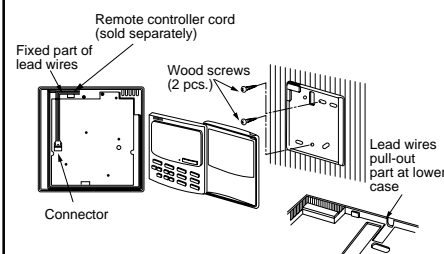


Fig. A

- For removal and mounting of the remote controller body and the rear case, refer to the item, "Using as concealed type".
- Remove the lead wires wound to the fixing part of lead wires of the remote controller body, remove the connectors, and then connect the remote controller cable (sold separately) to the connector section of the remote controller body. Insert the remote controller cable into the groove and form it, and wind it around the fixing part of lead wires.

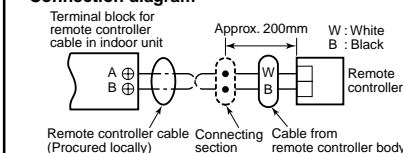
Notching the lower case (thin part of the upper center part) with nipper, etc., pull out the remote controller cables from this part. (Fig. A) (Refer to the item, "How to perform cabling of the remote controller".)

Connect cables of the remote controller after check of terminal No. of the indoor unit so that there is no miswiring. (Do not apply AC 200/230/240V to the remote controller.)

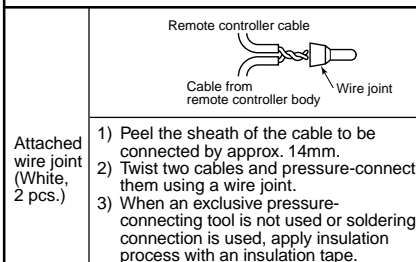
- Fix the remote controller body by two wood screws.
- Using the cable clips (Accessory of remote controller cable sold separately), fix the remote controller cable to the wall surface.

How to perform cabling of the remote controller

Connection diagram

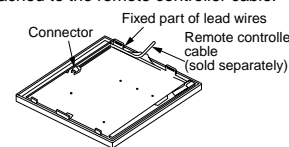


- Non polarity, 2 core cable is used.
- Use 0.5mm² to 2mm² cable.



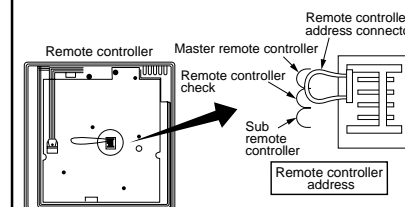
- For cabling of the remote controller, use the remote controller cable (sold separately).

- Remove the lead wires wound to the fixing part of lead wires of the remote controller body, remove the connectors, and then connect the remote controller cable (sold separately) to the connector section of the remote controller body. Insert the remote controller cable (sold separately) into the groove and form it, and wind it around the fixing part of lead wires.
- When using the remote controller cable (sold separately), refer to the Installation Manual attached to the remote controller cable.



Requirement for installation of multiple remote controllers

"2 remote controllers" means that one or multiple units are operated by the multiple remote controllers. (Max. 2 remote controllers can be set.)



How to install

For 2 remote controllers, install the remote controllers in the following procedure.

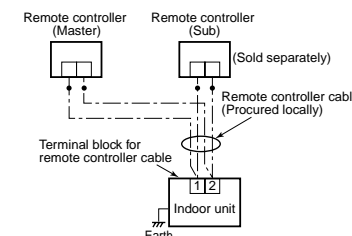
- Set one of two remote controllers as the master remote controller. (At shipment from factory)
- For the other remote controller, exchange the remote controller address connector of the master to sub remote controller on the P.C. board. Under this condition, the other remote controller functions as the sub controller.

Basic wiring diagram

NOTE :

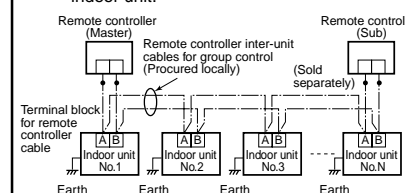
Connect cables without miswiring. (Miswiring breaks the unit.)

- In a case to operate an indoor unit from the remote controllers at two positions



- In a case to operate a group control of multiple indoor units from the remote controllers at two positions

*Master and Sub remote controllers are operable even if they are installed to any indoor unit.



Remote controller test run setup

- When the remote controller is used at the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on. It is not a trouble, but is because the setup of the remote controller is being checked.
- Push **[TEST]** key after [TEST] has been displayed on LCD by keeping **[SET]** button on the remote controller for 4 seconds or more.
 - During the test run, [TEST] is displayed on LCD.
 - The temperature cannot be controlled if [TEST] is displayed.

Do not use [TEST] in a case other than a test run, otherwise an excessive load is applied on the machine.
- Use [TEST] in one of HEAT, COOL, and FAN operation modes.

NOTE : The outdoor unit does not operate for approx. 3 minutes after the power supply has been turned on or the operation has stopped.
- After the test run has finished, push **[SET]** button again to check [TEST] on LCD has gone off. (For this remote controller, a release function of 60 minutes timer is provided to prevent continuous test runs.)

Accessory parts

Part Name	Q'ty	Part Name	Q'ty
Remote controller	1	Spacer	2
(200mm-cable attached)		Wire joint	2
Screw M4 x 25	2	Clamper	1
Wood screw	2	Installation Manual	1

Requirement to install the remote controller

Installation place

- Install the remote controller at a position within 1 to 1.5m from the floor, where the average temperature in the room can be felt.
- Do not install the remote controller at a place exposed to direct sunlight or direct outside air, such as a side of window, etc.
- Do not install the remote controller at a place behind something or rear side of something, where air flow is poor in the room.
- Do not install the remote controller in the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
- Be sure to set the remote controller vertically on the wall surface, etc.

How to select the room temp. sensor

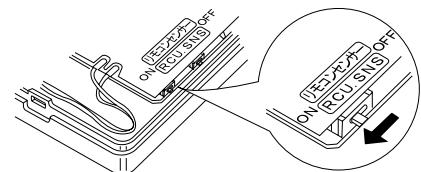
The room temperature sensors are equipped in the indoor unit and the remote controller. One of two sensors works. Usually, the room temperature sensor in the indoor unit is set to work. To select the sensor in the remote controller, turn the remote controller sensor from OFF to ON.

NOTE 1 :

Selecting the sensor in the remote controller is impossible on the sub remote controller.

NOTE 2 :

Do not select the sensor in the remote controller when a remote controller sensor is used. (Because it causes a straying.)



How to install the remote controller switch

NOTE 1 :

Avoid to twist the remote controller cable with the power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

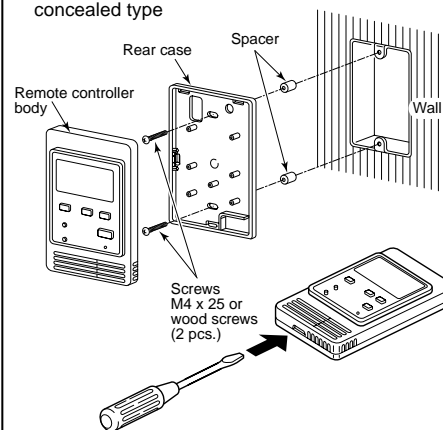
NOTE 2 :

Install the remote controller apart from the generation source of noise.

NOTE 3 :

When noise is contained to the power source of the indoor unit, counter measures such as mounting the noise filter is necessary.

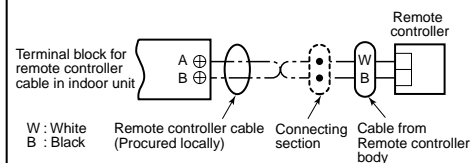
- In case of using the remote controller as a concealed type



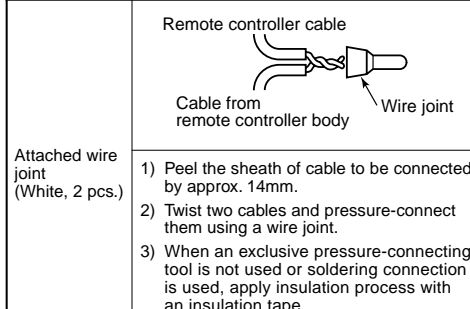
1. Inserting a minus screwdriver, etc. into the groove at the lower side of the remote controller body, force open the rear case to remove it.
2. Using the attached M4 screws (2 pcs.), fix the rear case of the remote controller. Before installation, press to open the screw hole with a screwdriver, etc. Fix it with the spacer, but not so strongly. If the remote controller does not fit closely to the wall, adjust it by cutting off the spacer.
3. Connect the remote controller cable (2 cores) to the cable from the remote controller body. Connect the remote controller cable without miswiring upon confirmation of the terminal numbers of the indoor unit. (If applied AC 220/230/240V, may damage the unit.)
4. Install the remote controller body to hooks on the rear case and putting into the hooks.

How to perform cabling of the remote controller

• Connection diagram

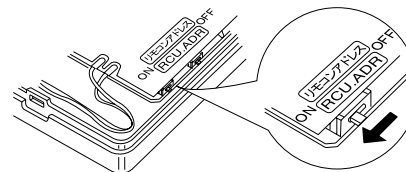


- Non polarity, 2 core cable is used.
- Use 0.5mm² to 2 mm² cable.



Requirement for installation of multiple remote controllers

"2 remote controller control" means that one or multiple units are operated by the multiple remote controllers.



• How to install

For 2 remote controller control, install the remote controllers in the following procedure.

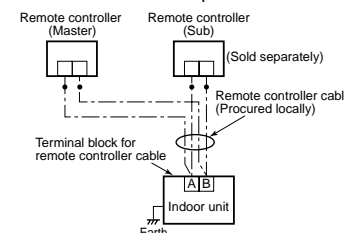
1. Set one of the set multiple remote controllers to the master remote controller. (At shipment from factory)
2. For other remote controllers, turn the remote controller address switch on the remote controller P.C. board from OFF to ON. They function as sub remote controllers under the above condition.

• Basic cabling diagram

NOTE :

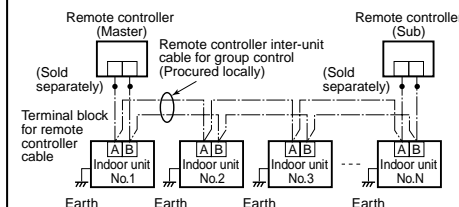
Connect cables without miswiring. (Miswiring breaks the unit.)

- In a case to operate an indoor unit from the remote controllers at two positions



- In a case to operate a group control of multiple indoor units from the remote controllers at two positions

* Master and sub remote controllers are operable even if they are installed to any indoor unit.



Remote controller test run setup

1. Push key after keeping [CHECK] button pushed on the remote controller for 4 seconds or more.

- During the test run, "TEST" is displayed on LCD.

- The temperature cannot be controlled if [TEST] is displayed. Do not use [TEST] in a case other than a test run, otherwise an excessive load is applied on the machine.

2. Use [TEST] in one of HEAT, COOL, and FAN operation modes.

NOTE :

The outdoor unit does not operate for approx. 3 minutes after the power supply has been turned on or the operation has stopped.

3. After the test run has finished, push [CHECK] button again to check "TEST" on LCD has gone off. (For this remote controller, a release function of 60 minutes timer is provided to prevent consecutive test runs.)

Accessory parts

Part Name	Q'ty
Program weekly timer	1
Connecting cable (Length: 1.2m)	1
Screws M4 x 25	2
Wood screws	2
Spacer	2
Owner's Manual	1
Installation Manual	1

Requirement to install the program weekly timer

Installing dimension for serial installation

When installing the program weekly timer (remote controller/system controller, etc.) to the wall surface, follow the installation procedure in (Fig. 1) and (Fig. 2).

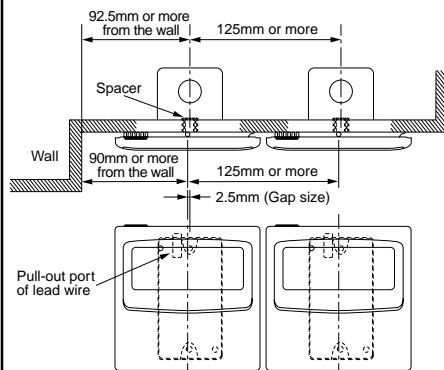


Fig. 1

*When installing the remote controller and the program weekly timer which are set in parallel at upper side and lower side, in consideration of maintenance, keep a clearance with 25mm or more.

How to install the program weekly timer

NOTE 1 :

Avoid to twist the program weekly timer cable with the power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

NOTE 2 :

Install the program weekly timer apart from the generation source of noise.

NOTE 3 :

When noise is induced to the power source of the indoor unit, measures such as mounting the noise filter is necessary.

- Install the program weekly timer to the box (Procured locally) which has previously inserted in the wall.

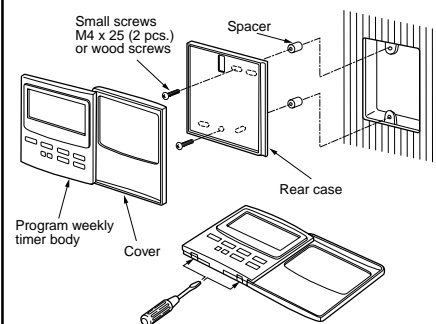
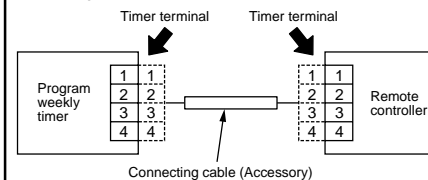


Fig. 2

- Inserting a minus screwdriver, etc. into the groove at the lower side of the program weekly timer, which appears when opening lid of the program weekly timer body, force open the rear case to remove it.
- Using the attached M4 screws or wood screws (2 pcs.), fix the rear case of the program weekly timer. Before installation, press to open the screw hole with a screwdriver, etc.
Fix it with the spacer, but not so strongly. If the program weekly timer does not fit closely to the wall, adjust it by cutting off the spacer.
- Connect the attached connecting cable (4 cores) to the program weekly timer body.
- Install the program weekly timer body by matching to hooks on the rear case and putting into the hooks.

Cabling

- Connection diagram**
(Be sure to use the attached connecting cable.)



- Arrangement**

The program weekly timer and the remote controller can be arranged to either right or left side.

- Cabling procedure**

Perform cabling in the following procedure.

- Connect the attached connecting cable to the timer terminal (4P connector) of the program weekly timer. (Fig. 3)

<Remote controller> <Program weekly timer>

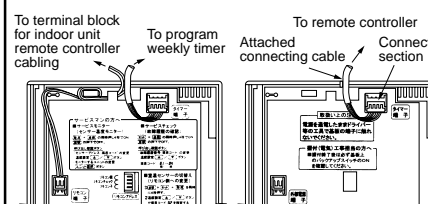


Fig. 3

- Pull the attached cable out of lead wire pull-out port on the rear case of the program weekly timer and connect the cable to the timer terminal (4P connector) of the remote controller via inside of the wall. (Fig. 4)

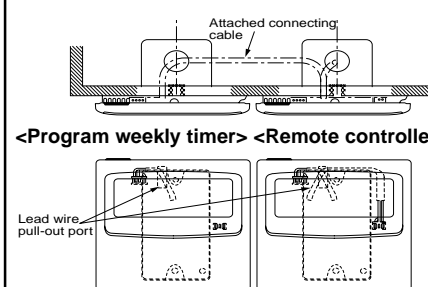
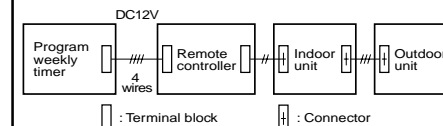


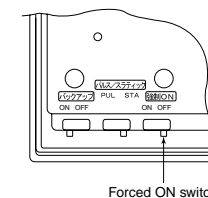
Fig. 4

System diagram



Program weekly timer test run setup

- After installation, check (OFF to ON) output status using the forced ON switch on the rear side of the program weekly timer P.C. board. Then check the normal operation and **certainly turn OFF the forced ON switch.**

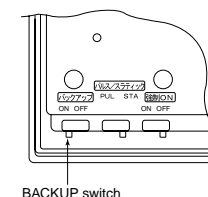


Memory backup function for power failure compensation

- This program weekly timer stores in memory the contents set by the operation button during a power failure. Pushing (PROGRAM) button resumes the operation with the contents before the power failure when the power failure has been reset.

- How to use [BACKUP]**

After the installation work, check [BACKUP] switch on the rear side of the program weekly timer P.C. board is turned to ON side.



Explanation to customers

- After the installation work, hand "Owner's Manual" and "Installation Manual" to the customers.
- Explain use and maintenance methods to the customers according to "Owner's Manual".

TOSHIBA INSTALLATION MANUAL

To Personnel Charged in Installation (Electric) Work and Service

Remote sensor
MODEL : TCB-TC21LE

Accessory parts

Part Name	Q'ty	Part Name	Q'ty
Remote sensor (200mm-cable attached)	1	Spacer	2
Small screw M4 x 25	2	Wire joint	2
Wood screw	2	Cable clumper	1
		Installation Manual	1

Requirement to install the remote sensor

Installation place

- Install the remote sensor at a position with height 1 to 1.5m from the floor, where the average temperature in the room can be felt.
- Do not install the remote sensor at a place exposed to the direct sunlight or direct outside air, such as a side of window, etc.
- Do not install the remote sensor at a place behind something or rear side of something, where air flow is poor in the room.
- Do not install the remote controller near the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
- Be sure to set the remote sensor vertically on the wall surface, etc.

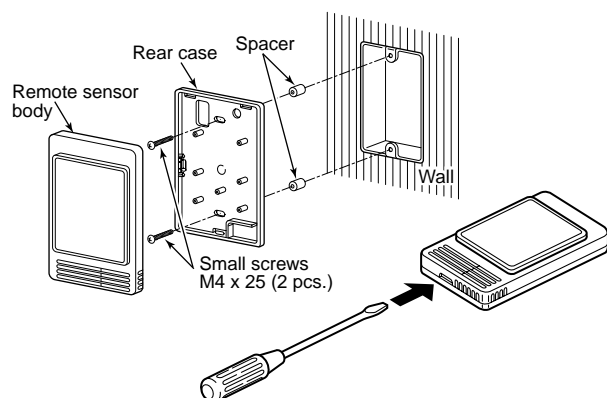
How to install the remote sensor

NOTE 1 : Avoid to twist the remote sensor cable with the power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

NOTE 2 : Install the remote sensor apart from the generation source of noise.

NOTE 3 : When noise is induced to the power source of the indoor unit, some measures such as mounting the noise filter is necessary.

- In case of using the remote sensor as a concealed type



1. Inserting a minus screwdriver, etc. into the groove at the lower side of the remote sensor body, force open the rear case to remove it.
2. Using the attached M4 screws (2 pcs.), fix the rear case of the remote sensor. Before installation, press to open the screw hole with a screwdriver, etc.

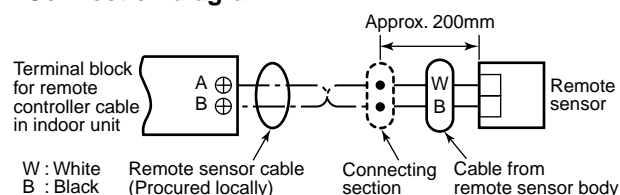
Fix it with the spacer, but not so strongly. If the remote sensor does not fit closely to the wall, adjust it by cutting off the spacer.

3. Connect the remote sensor cable (2 cores) to the terminal numbers of the indoor unit.
(Applying AC 220/230/240V breaks the unit.)
4. Install the remote sensor body by matching to hooks on the rear case and putting into the hooks.

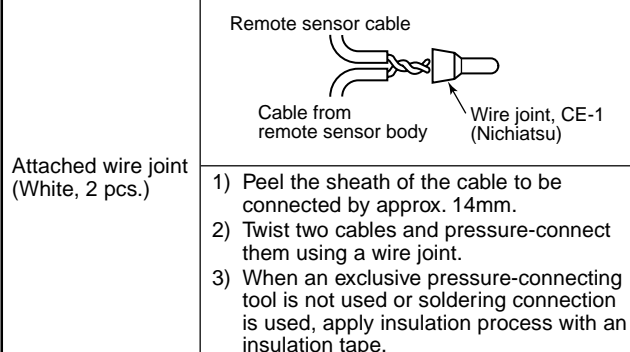
How to perform cabling of the remote sensor

In case of using the remote sensor as a concealed type

• Connection diagram



- Non polarity, 2 core cable is used..
- Use 0.5mm² to 2 mm² cable.



Requirement for using the remote sensor together with the remote controller

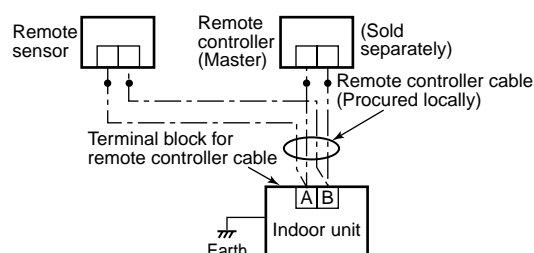
• How to install

For the above control, install the remote sensor in the following procedure.

1. Set the remote controller as the master remote controller.
2. Do not change the remote sensor switch in the master remote controller for correct temperature control by remote sensor.

• Basic cabling diagram

1. Connect cables without miswiring.
(Miswiring breaks the unit.)
2. In a case to operate an indoor unit from the remote sensors and the remote controller.



INSTALLATION MANUAL

Remote Controller Wireless Kit

RBC-AX22CE







Thank you very much for purchasing TOSHIBA Remote Controller for Air Conditioner. Please read this owner's manual carefully before using your Remote Controller for Air Conditioner.

- Be sure to obtain the "Owner's manual" and "Installation manual" from constructor (or dealer).

Request to constructor or dealer

Please clearly explain the contents of the Owner's manual and hand over it.

Accessory parts

No.	Accessory	Q'ty	No.	Accessory	Q'ty
1	Sensor unit 	1	4	Battery 	2
2	Remote controller 	1	5	Owner's Manual 	1
3	Remote controller holder 	1	6	Truss tapping screw, 4 x16 	2

Installation of sensor unit

1. Open the suction grille, remove a screw, move the side panel toward you (direction of arrow), and then remove the side panel. (Fig. A)
 2. Lap the end of flat head screw driver with vinyl tape, and forcedly insert it into the groove at the side under circle mark on the cover. (Be careful not to damage the panel.) (Fig. B)
 3. Pass the lead wire through the panel, and install the sensor unit to the panel hole. (Projection of the sensor unit is fixed by the panel hole.)
 4. Fix the lead wire of the sensor to the cord clamp which fixes the cables of the louver motor. (Fig. C)
 5. Install the side panels.
 6. Put the lead wire from the sensor unit along cables of the louver motor and others, and then fix it with the cord clamp. (Fig. D)
- * Draw in it using a hole at the upper side of the electric box.

Fig. A

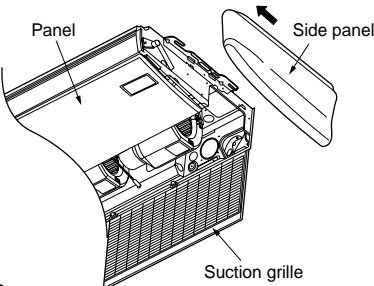


Fig. C

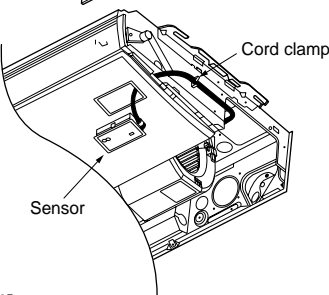


Fig. B

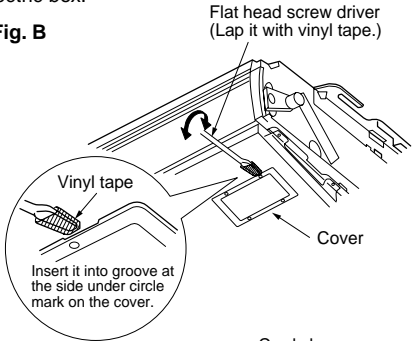
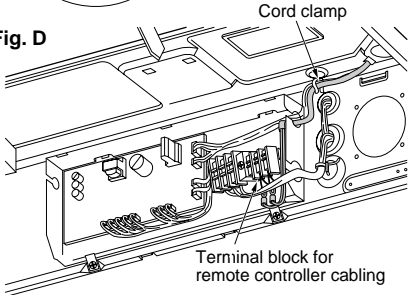


Fig. D



[NOTE 1]

Avoid to twist cables of the sensor with the power cables, otherwise a malfunction is caused.

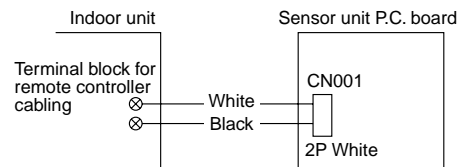
* For cabling and test run, refer to "Cabling of sensor unit" of these sheets and "Test run" of the Installation Manual attached to the indoor unit.

How to perform cabling of sensor units

Connection diagram

Connection

- Connect the cables out of the sensor unit to the terminal block for remote controller cabling of the indoor unit. (There is no polarity.)



Requirement

The control by two remote controllers is enabled by installing the wireless remote controller with the wired remote controller for an indoor unit.

(Max. 2 remote controllers of wireless or wired are installable.)

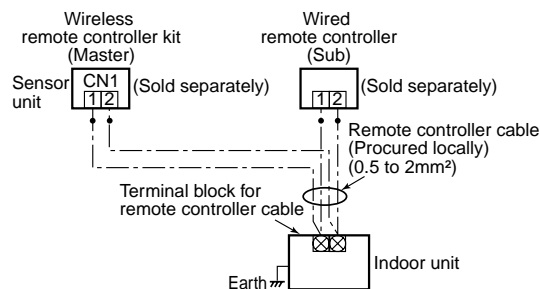
"2-remote controllers" controlling means that one or multiple units are operated by the multiple remote controllers.

NOTES :

- Upon confirmation of the terminal numbers of the indoor unit, connect the remote controller cables without miscabling. (If applied AC 220–240 Volt, damage the unit.)
- The multiple wireless remote controller kits cannot concurrently be used for an indoor unit.
- When installing simultaneously the wireless remote controller with the wired remote controller, set one of them as the sub remote controller.
 - When setting the wired remote controller as the sub, exchange the address connector at the rear of P.C. board of wired remote controller from master to sub remote controller.
 - When setting the wireless remote controller as the sub, turn No.3 of DIP switch [S003] on P.C. board of wireless remote controller sensor unit from OFF to ON.

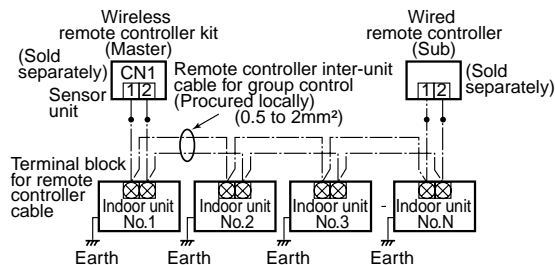
To operate an indoor unit by 2 remote controllers

- The indoor unit is operated if either wireless or wired remote controller is set as master or sub remote controller. (Total cable length: Within 400m)



To operate a group control of multiple indoor units by 2 remote controllers

- Master and Sub remote controllers are operable even if they are installed to any indoor unit. (Total cable length: Within 200m)



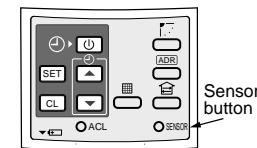
How to set the room temperature sensor

- The room temperature sensors are equipped in the indoor unit and the wireless remote controller. One of two sensors works.
- The room temperature sensor is set to the indoor unit side at the shipment from the factory. To select the sensor in the remote controller, push the SENSOR button (Right figure) inside of the remote controller cover and check "Main sensor" disappears from LCD.

NOTE :

If the room temperature data from the remote controller is not transmitted to the unit for 10 minutes or more, the sensor at indoor unit side is automatically selected even if the sensor at the remote controller side is selected.

Fix the remote controller toward the unit as possible.



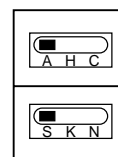
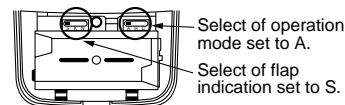
How to set the address switch

- When the multiple sensors are installed in the same room, an address can be set to prevent cross communication.
- When replacing the battery and pushing SET button, the address of the remote controller becomes [ALL] and the sensor is enabled to receive signal regardless of setting of address switch of the operation section.
- For selecting of the remote controller address, refer to Owner's Manual.
- Change the address of the sensor by removing screws of P.C. board cover of the sensor unit. After then, fix the cover with screws using a clamp.

Display of remote controller address	Address	Address	Address	Address
	ALL	1	2	...
Address switch position of sensor	* Address switch of sensor unit can be set any position.	4-6 1-3 S001 Address select	4-6 1-3 S001 Address select	4-6 1-3 S001 Address select

Slide switch

- Check the slide switch in the battery box of the remote controller is set to [S] / [A] at shipment from the factory. Do not change the setting.



Lamp indication of sensor
 ● : Goes off
 ☼ : Flash (0.5-sec. interval)

Self-diagnosis table and measures

Lamp indication	Cause	Measures
	Power supply is not turned on. Miscabling between sensor unit and indoor unit	Check cable connection and correct it.
	Defective connection between sensor unit and indoor unit	
	Miscabling or defective connection between indoor and outdoor units	
	Protective device of outdoor unit works.	Check outdoor unit.
	Protective device of indoor unit works.	Check indoor unit.

How to set up filter sold separately of the high ceiling

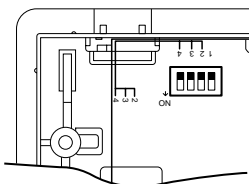
- When the height of ceiling to be installed with a filter exceeds 3.5m or when installing a filter sold separately, tap-up of DC fan is required. Tap-up of DC fan can be set at No.2 (Tap 1) and No.4 (Tap 2) of DIP switch [S003] on the wireless sensor P.C. board.

The wireless sensor P.C. board appears by removing screws at the rear side of the wireless sensor unit and the rear cover.

Setup for high ceiling

	[S003] No.2 (Tap 1)	[S003] No.4 (Tap 2)	Installable height of ceiling
Standard (At shipment)	OFF	OFF	3.5m
Type 1	OFF	ON	4.0m

[S003] No.2 (Tap 1) and [S003] No.4 (Tap 2) are used.



Setup for filter sold separately

	[S003] No.2 (Tap 1)	[S003] No.4 (Tap 2)	Filter sold separately
Standard (At shipment)	OFF	OFF	Standard filter
Type 1	OFF	ON	Optical regeneration deodorant filter
Type 3	ON	OFF	High-performance filter
Type 6	ON	ON	Deodorant filter / Ammonia deodorant filter

[NOTE]

If the setup has been once performed, the set contents of Type 1, 3, and 6 can be arbitrarily changed. However, it is required to turn off [S003] No.2 (Tap 1) and No.4 (Tap 2) of DIP switch and also required to rewrite by the wired remote controller sold separately to return the set content to the standard one (at shipment). (For rewriting by a wired remote controller sold separately, refer to the Installation Manual attached to the indoor unit.)

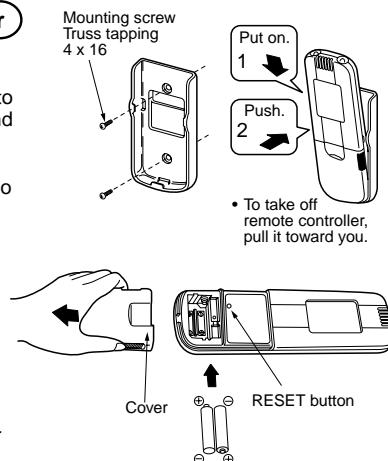
Never set ON to DIP switch [S003] No.1 (Test run). (A test run is carried out on the remote controller.) (For the test run, refer to the Installation Manual attached to the indoor unit.)

Cautions for installation of the remote controller

- To operate the remote controller by fixing it to the wall, etc. with a remote controller holder, turn on the fluorescent lamp, operate the remote controller at the position to be fixed, check the air conditioner normally operates, and then mount it.
- When the room temperature is sensed by the remote controller, mount the remote controller paying attention to the following items.
 - Place not exposed directly to cold or hot wind.
 - Place not exposed directly to the sunlight.
 - Other places where the remote controller is not influenced.

Explanation to customers

- Hand over the "Owner's Manual" and "Installation Manuals" to the customer after installation works.
- Explain usage and maintenance of the remote controller according to "Owner's Manual".



Test run

Before test run

- Before turning on the power supply, carry out the following procedure.
 - Using 500V-megger, check 1MW or more exists between the terminal block 1 to 3 and the earth. If 1MW or less is detected, do not run the unit. Do not apply to the remote controller circuit.
 - Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more before operating.

How to execute a test run

Using the remote controller, operate the unit as usual.

For the procedure of the operation, refer to the attached Owner's Manual.

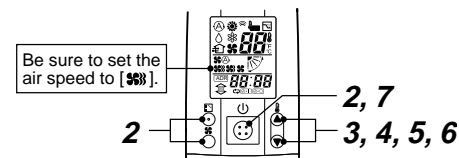
A forced test run can be executed in the following procedure if the operation stops by thermo-OFF. In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

CAUTION

When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on. It is not a trouble, but is because the setup of the remote controller is being checked. For the second power-ON time and after, approx. 1 minute is required to start the operation by the remote controller.

NOTE

Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.



In case of wireless remote controller

Procedure	Operation contents				
1	Turn on power of the set. After installation, the operation is not accepted for 5 minutes when the power has been turned on at the first time, and 1 minute when the power has been turned on at the second time and after. Perform a test run after a specified time has passed.				
2	Push [] button on the remote controller, change the operation mode to [] or [] by using [] button, and then change the air speed to [5%] by [] button.				
3	<table border="1"> <thead> <tr> <th>Cooling test run</th><th>Heating test run</th></tr> </thead> <tbody> <tr> <td>Set temperature to [18°C] by using [] button.</td><td>Set temperature to [30°C] by using [] button.</td></tr> </tbody> </table>	Cooling test run	Heating test run	Set temperature to [18°C] by using [] button.	Set temperature to [30°C] by using [] button.
Cooling test run	Heating test run				
Set temperature to [18°C] by using [] button.	Set temperature to [30°C] by using [] button.				
4	Push [] button to set temperature to [19°C] just after confirming the receiving sound "Pi".				
5	Push [] button to set temperature to [18°C] just after confirming the receiving sound "Pi".				
6	Repeat the procedure 4 → 5 → 4 → 5. After approx. 10 seconds, all the display lamps [] (Green), [] (Green), and [] (Yellow) of the wireless sensors flash, and the operation starts. If the lamps do not flash, repeat the procedure 2 and after.				
7	When the test run has finished, push [] button to stop the operation.				

<Outline of test run by using a wireless remote controller>

Cooling test run : Start/Stop → 18°C → 19°C → 18°C → 19°C → 18°C → 19°C → 18°C → (Test run) → Start/Stop
 Heating test run : Start/Stop → 30°C → 29°C → 30°C → 29°C → 30°C → 29°C → 30°C → (Test run) → Start/Stop

Accessory parts

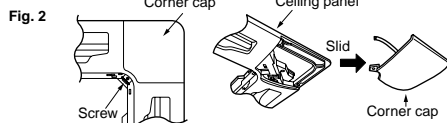
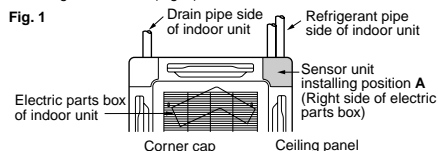
Part Name	Q'ty	Part Name	Q'ty
Sensor unit	1	Battery	2
		Owner's Manual	1
		Tapping screw M4 x 16mm	2
Remote controller	1	Clamper	1
Remote controller holder	1	Fixing screw M4 x 12mm	1

• How to set the fan motor speed refer to the OWNER'S MANUAL

How to install the sensors

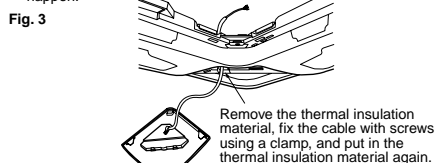
* The positions where the sensors can be installed are limited to the corners (A) in Fig. 1. Therefore, for installation of the sensor units, consider the direction when a panel is installed to the indoor unit.

1. Remove the suction grille.
2. Take off the screw fixing the corner cap and remove the corner cap sliding it side-ward. (Fig. 2)

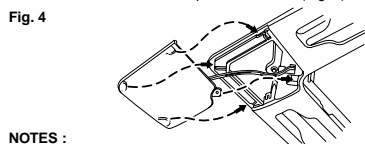


3. The thermal insulation material is stuffed in the square hole provided to pass through cables of the panel, so take off it once and pass the cable out of the sensor of wireless remote controller through the grille. Using a clamp, fix the cable with screws and then be sure to stuff again the removed thermal insulation material as original. (Fig. 3)

If the thermal insulation material is not stuffed, dewing may happen.



4. After cabling according to "How to perform cabling of sensor units", remain the cable length enough to remove the sensor unit and fix it with screws using a clamp. (Fig. 3)
5. Install the sensor units to the panel. In this time, slide the panel so that the hooks are fit in completely at 3 positions. And also be careful not to pinch the cable. (Fig. 4)

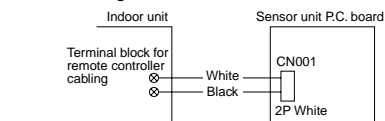


NOTES :

1. Avoid to twist the cables of the operation section with cables of the power supply, etc. It causes a malfunction.
2. When noise is contained to the power supply of the indoor unit, counter measures such as mounting the noise filter is necessary.

How to perform cabling of sensor units

Connection diagram



Connection

- Connect the cables out of the sensor unit to the terminal block for remote controller cabling of the indoor unit. (There is no polarity.)

Requirement

The control by two remote controllers is enabled by installing the wireless remote controller with the wired remote controller for an indoor unit.

(Max. 2 remote controllers of wireless or wired are installable.)

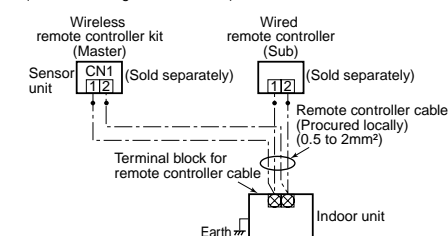
"2-remote controllers" controlling means that one or multiple units are operated by the multiple remote controllers.

NOTES :

1. Upon confirmation of the terminal numbers of the indoor unit, connect the remote controller cables without miscabling. (If applied AC 220/230/240 Volt, damage the unit.)
 2. The multiple wireless remote controller kits cannot concurrently be used for an indoor unit.
 3. When installing simultaneously the wireless remote controller with the wired remote controller, set one of them as the sub remote controller.
- When setting the wired remote controller as the sub, exchange the address connector at the rear of P.C. board of wired remote controller from master to sub remote controller.
 - When setting the wireless remote controller as the sub, turn No.3 of DIP switch [S003] on P.C. board of wireless remote controller sensor unit from OFF to ON.

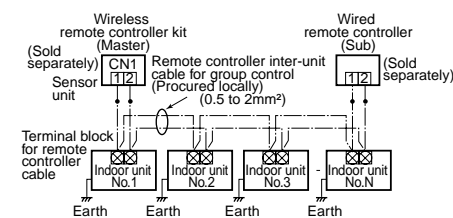
To operate an indoor unit by 2 remote controllers

* The indoor unit is operated if either wireless or wired remote controller is set as master or sub remote controller. (Total cable length: Within 400m)



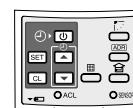
To operate a group control of multiple indoor units by 2 remote controllers

* Master and Sub remote controllers are operable even if they are installed to any indoor unit. (Total cable length: Within 200m)



How to set the room temperature sensor

- The room temperature sensors are equipped in the indoor unit and the wireless remote controller. One of two sensors works.
- The room temperature sensor is set to the indoor unit side at the shipment from the factory. To select the sensor in the remote controller, push the SENSOR button (Right figure) inside of the remote controller cover and check "Main sensor" disappears from LCD.



NOTE :

If the room temperature data from the remote controller is not transmitted to the unit for 10 minutes or more, the sensor at indoor unit side is automatically selected even if the sensor at the remote controller side is selected. Fix the remote controller toward the unit as possible.

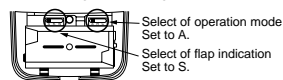
How to set the address switch

- When the multiple sensors are installed in the same room, an address can be set to prevent cross communication.
- When replacing the battery and pushing SET button, the address of the remote controller becomes [ALL] and the sensor is enabled to receive signal regardless of setting of address switch of the operation section.
- For selecting of the remote controller address, refer to Owner's Manual.
- Change the address of the sensor by removing screws of P.C. board cover of the sensor unit. After then, fix the cover with screws using a clamp.

Display of remote controller address	Address	Address	Address	...	Address
	ALL	1	2		6
Address switch position of sensor	S001 S002	S001 S002	S001 S002	...	S001 S002

Slide switch

- Check the slide switch in the battery box of the remote controller is set to [S] / [A] at shipment from the factory. Do not change the setting.



Self-diagnosis table and measures

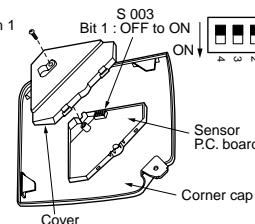
Lamp indication	Cause	Measures
No indication even if the remote controller is operated.	Power supply is not turned on. Miscabling between sensor unit and indoor unit	Check cable connection and correct it.
Flashes alternatively	Defective connection between sensor unit and indoor unit Miscabling or defective connection between indoor and outdoor units	Check outdoor unit.
Flashes alternatively	Protective device of outdoor unit works.	Check indoor unit.
Flashes alternatively	Protective device of indoor unit works.	Check indoor unit.

Lamp indication of sensor
● : Goes off
* : Flash (0.5-sec. interval)

Test run

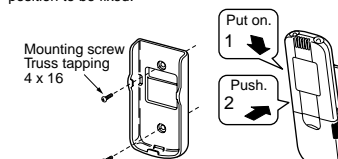
- How to use [TEST]
- 1. Turn No.1 of DIP switch [S003] on sensor P.C. board from OFF to ON.
- 2. During the test run, all the indication lamps on LCD flash.
- 3. During the test run, the temperature cannot be controlled.
- 4. After the test run, be sure to turn DIP switch 1 from ON to OFF and check the indication lamps do not flash.

Use [TEST] function only for a test run, otherwise the unit is overloaded. Fix the cover as original.



How to handle the remote controller

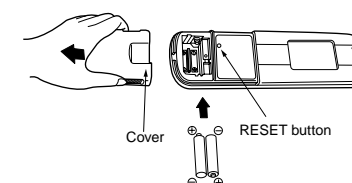
- In case using remote controller mounting to the wall, etc. Check a signal is received correctly by pushing (1) button at the position to be fixed.



- To take off remote controller, pull it toward you.

• Replacement of battery

1. Holding the both ends of the cover and remove it by sliding downward.
2. Correctly insert 2 AAA alkali batteries matching + and - polarities with indications.
3. Push SET button with something tipped and attach the cover.



Cautions for installation of the remote controller

- To operate the remote controller by fixing it to the wall, etc. with a remote controller holder, turn on the fluorescent lamp, operate the remote controller at the position to be fixed, check the air conditioner normally operates, and then mount it.
- When the room temperature is sensed by the remote controller, mount the remote controller paying attention to the following items.
 - Place not exposed directly to cold or hot wind.
 - Place not exposed directly to the sunlight.
 - Other places where the remote controller is not influenced.

Explanation to customers

- Hand over the "Owner's Manual" and "Installation Manuals" to the customer after installation works.
- Explain usage and maintenance of the remote controller according to "Owner's Manual".

TOSHIBA INSTALLATION MANUAL

Ceiling Panel

MODEL: RBC-U21PG (W)-E

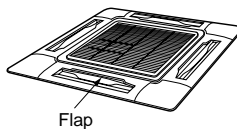
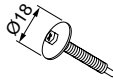

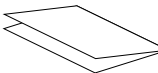
Cautions on Safety

- Before installation work, read this "Cautions on Safety" thoroughly.
- Strictly keep the following items in mind because they describe the serious contents concerned with safety. The indications and meanings are as follows:
- After installation work, accompanied with a test run to check if there is no trouble, explain the use method and maintenance of the unit to the customers according to Owner's Manual. And also ask the customers to obtain this Ceiling Panel Installation Manual together with Owner's Manual and Installation Manual of the indoor unit.

WARNING

- Ask an authorized dealer or qualified installation professional to install the ceiling panel. Inappropriate installation may result in water leakage, electric shock or fire if you install it by yourself.
- Carry out an installation work securely according to this Installation Manual. Inappropriate installation may result in water leakage, electric shock or fire.
- A person qualified in the electric work should execute the electric works according to the Installation Manual and should use the exclusive circuits. The voltage should be matched with the rated voltage of the product. The capacity shortage of electric circuit or inappropriate installation may result in electric shock or fire.
- Never modify or repair the product. Incomplete modification or repair may result in electric shock or fire.

Components

Name	Ceiling panel	Screw with washer	Screw	Installation manual
Q'ty	1	4 ØM5mm x 40mm	4 ØM4mm x 12mm	1
Shape				

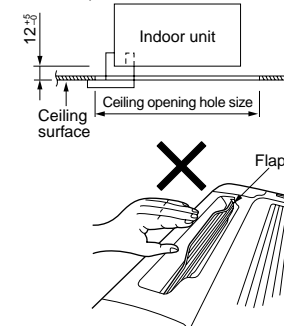
- Never apply an excessive force on the flap. It causes a trouble.

1. Preparation before installation of ceiling panel

(1) Position check of indoor unit

1. Check the position of the indoor unit according to the Installation Manual.
2. Check the size of the ceiling opening hole, applied the following range.
860mm x 860mm to 910mm x 910mm
3. Using the installation gauge attached to the indoor packing, execute positioning of the ceiling surface and the indoor unit. If position of the ceiling surface does not match with position of the indoor unit, air leak, water leak (dewing), or malfunction of the flap is caused.

Keep the range within 12 $\frac{3}{8}$, otherwise, a trouble is caused.

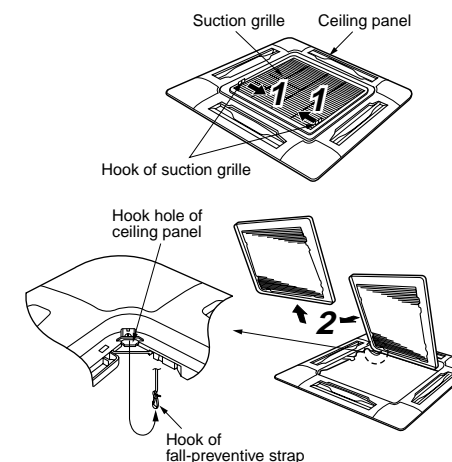


- Never put the ceiling panel downward, lean it, or leave it on a projection to avoid a damage on the surface of the ceiling panel.
- Do not apply an excessive force on the flap when hanging it tentatively to the indoor unit. (It causes a trouble on the flap.)

2. Installation to indoor unit

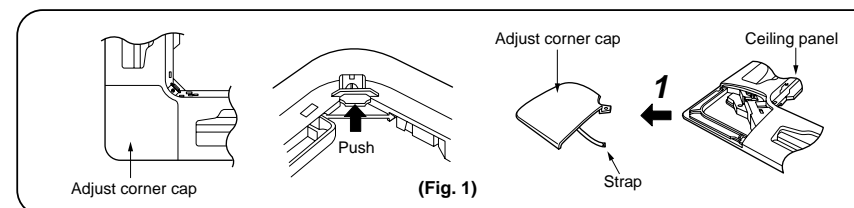
(1) Removal of suction grille

1. Open the suction grille by sliding the hook out of the suction grille along the arrow direction 1.
2. Take off hook of the fall-preventive strap from the ceiling panel.
 - Do not take off screws of the fall-preventive strap at the suction grille side.
3. As the suction grille opened, remove the hinge section of the suction grille from the ceiling panel toward the arrow direction (2).



(2) Removal of adjust corner cap

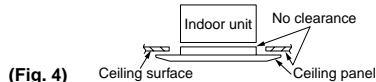
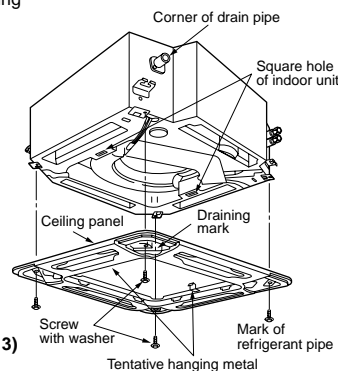
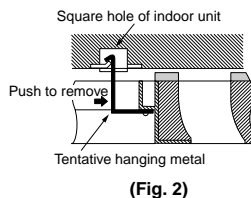
1. Slide the adjust corner cap along the arrow direction 1, and then remove the adjust corner cap. (Fig. 1)



(3) Installation of ceiling panel

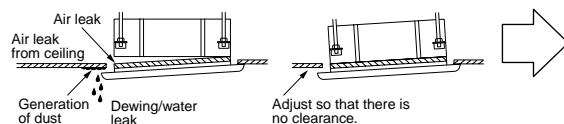
The angle change of the flap is possible while the power supply is turned on. (Do not move forcibly the flap with hands. It may break the flap.)

- For tentative hanging, insert the tentative hanging metal (stainless) inside of the ceiling panel into the square hole of the indoor unit. (Fig. 2)
 - The ceiling panel has directional ability against the indoor unit. Direct the mark of **refrigerant pipe** at the ceiling panel corner toward the pipe side.
 - Holding the ceiling panel, remove it while pushing the tentative hanging metal toward the outside.
- Match the mounting hole of the panel with the screw hole of the indoor unit.
- Using the attached screws with washer, tighten 4 positions at corners of the suction port until the panel is fitted closely to the main unit. (Fig. 3)
- Check the panel is fitted closely to the ceiling.
 - In this time, check there is no clearance between the indoor unit and the ceiling panel, and between the ceiling panel and the ceiling surface. (Fig. 4)



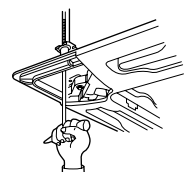
CAUTIONS

- Tighten the screws securely because a trouble is caused as shown in the following figure if the screws are incompletely tightened.
- When there is a clearance between the ceiling surface and the ceiling panel even if the screws have been tightened, readjust height of the indoor unit.



(Fig. 5)

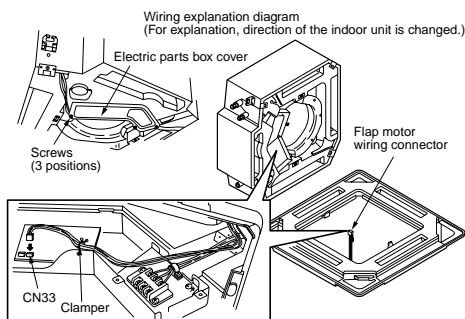
The height of the indoor unit can be adjusted from corner hole on the ceiling panel as the ceiling panel is installed if the adjustment does not affect the levelness of the indoor unit, drain pipe, etc.



(Fig. 6)

(4) Cabling of ceiling panel

- Open cover of the electric parts box.
- Connect the flap motor wiring connector out of the ceiling panel to the connector 5P (CN33: white) on P.C. board of the indoor unit.
 - Connect the connector surely because the flap does not work if the connector is not connected.**
- Mount cover of the electric parts box in the reverse procedure of opening of the cover.
 - Check whether the wiring connector is pinched between the electric parts box and the cover or not.**
 - Check whether the wiring connector is pinched between the indoor unit and the ceiling panel or not.**



(Fig. 7)

(5) Installation of adjust corner cap/suction grille

Install the adjust corner cap/suction grille in the reverse procedure of **installation to the indoor unit**.

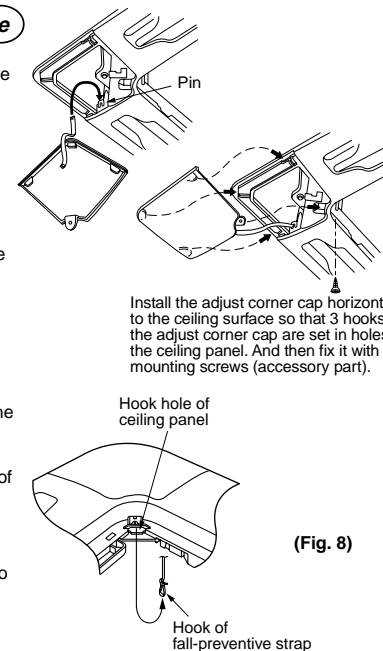
- For this ceiling panel, as shown in the following figure, the direction of the suction grille can be changed on customer's demand when multiple indoor units are installed.

A. Installation of adjust corner cap

- Hook the strap of the adjust corner cap surely to the pin on the ceiling panel.
- Install the adjust corner cap to the ceiling panel, and fix it with the mounting screws. (accessory part)

B. Installation of suction grille

- To install the suction grille, follow to the reverse procedure of the removal. This ceiling panel can be installed from anyone of 4 directions by turning the suction grille. Change the direction on the customer's demand or according to the direction matching of the suction grille when multiple units are installed.
- When installing the suction grille, be sure not to pinch the flap motor wiring connector.**
- Be sure to attach a strap to prevent falling of the suction grille to the ceiling panel.



(Fig. 8)

3. Others

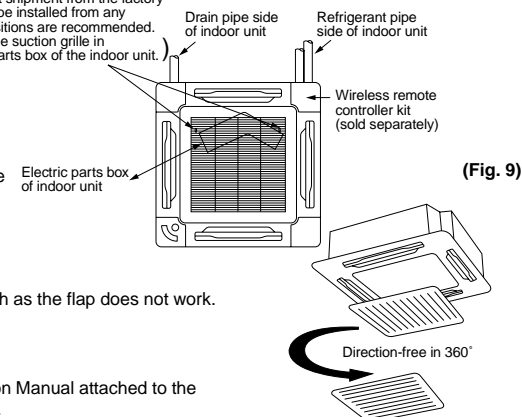
Positions of suction grille hooks at shipment from the factory
 • Although the suction grille can be installed from any position of 4 corners, these positions are recommended.
 (It is unnecessary to remove the suction grille in maintenance for the electric parts box of the indoor unit.)

A. Check after installation

- Check again there is no clearance between the indoor unit and the ceiling panel, and between the ceiling panel and the ceiling surface.
 - A clearance causes water leak or dewing.
- Check the cables are connected surely.
 - Incomplete connection causes a trouble such as the flap does not work.

B. For wireless remote controller

- For details of installation, refer to the Installation Manual attached to the wireless remote controller kit (sold separately).



(Fig. 9)

After confirmation of the above items, hand a set of this manual, manuals for the indoor unit, manual for products sold separately, etc. to the customer. For cleaning of the filter, be sure to ask the maintenance professional.

INSTALLATION MANUAL

DRAIN PUMP KIT FOR UNDER CEILING TYPE

TCB-DP22CE

Please read this Installation Manual carefully before installing the Air Conditioner.





- This Manual describes the installation method of the indoor unit.
- For installation of the outdoor unit, follow the Installation Manual attached to the outdoor unit.





ADOPTION OF NEW REFRIGERANT

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

Accessory parts and Parts to be procured locally

Accessory parts

Part name	Q'ty	Shape	Usage
Drain up kit	1		—
Drain up kit fixture	1		For mounting drain up kit
Drain hose	1		For connecting vinyl chloride pipe of drain up kit
Thermal insulating pipe	1		For thermal insulation of drain hose
Installation Manual	1	This manual	Be sure to hand to users.

Part name	Q'ty	Shape	Usage
Drain hose fixing band	2		For fixing drain hose
Thermal insulator for drain connecting section	2		For thermal insulation of drain hose connecting section
Thermal insulator of ceiling panel	1		For sealing upper piping hole of indoor unit
Screw	4		For fixing drain up kit For fixing fixture of drain up kit

Specification

Drain up kit model name	Height of drain up
TCB-DP22C	600mm or lower from top face of the set

WARNING

For this drain up kit, please use the elbow piping kit (MODEL: TCB-KP12CE, KP22CE) sold separately.
If using a piping kit procured locally, it may cause a water leak or so on.

1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION

New Refrigerant Air Conditioner Installation

- THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.


Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION

To Disconnect the Appliance from Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (25A D type ) must be used for the power supply line of this conditioner.

⚠ WARNINGS

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
Do not store it in a wet basement or expose to rain or water.

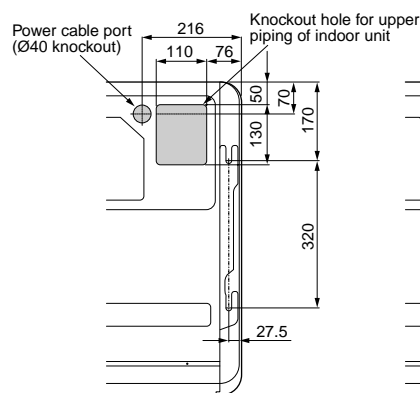
1 PRECAUTIONS FOR SAFETY

- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
If a combustible gas leaks, and stays around the unit, a fire may occur.

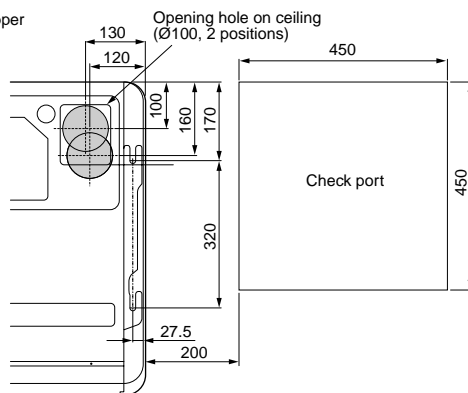
2 PREPARATION FOR INSTALLATION OF DRAIN UP KIT

Cautions on installation

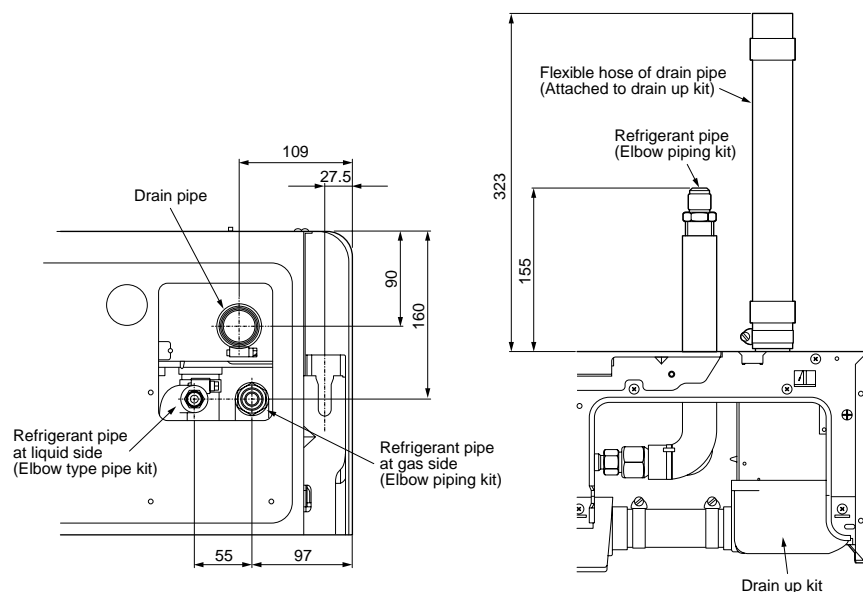
- In the installation work of the drain up kit, the pipe cannot be draw out from other side than the upper side.
- Apply thermal insulation for all the drain pipes.
- Open two opening holes (Ø100, 2 positions) on the ceiling surface to be installed in order to pass refrigerant pipe and drain pipe.
- Set a 450-square check port on the ceiling surface to be installed.



Knockout positions at the upper part of indoor unit



Opening hole positions on ceiling



Refrigerant pipe and drain pipe positions

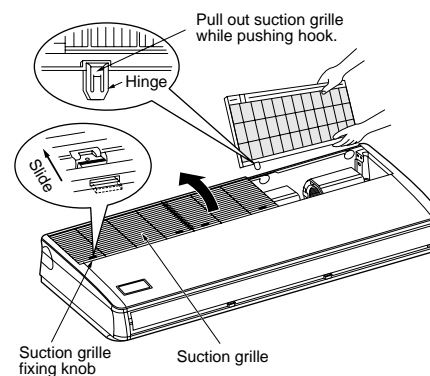
3 INSTALLATION PROCEDURE OF DRAIN UP KIT

Before installation

1. Removal of suction grille

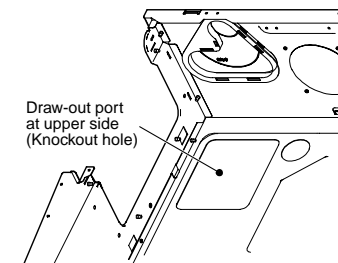
Slide the suction grille fixing knobs (2 positions) toward the arrow direction, and then open the suction grille.

Under the condition of suction grille opened, push the hook section of hinges (2 positions) at the rear side, and then pull out the suction grille.



Knockout hole

Open the draw-out port (Knockout hole) at upper side.

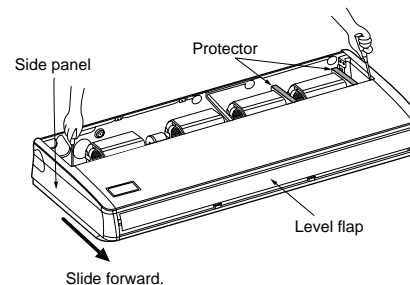


Connection of ELBOW PIPING KIT

Connect "ELBOW PIPING KIT" sold separately to the indoor unit.

2. Removal of side panel

After removing the side panel fixing screws (1 each at right and left), slide the side panel forward and then remove it.

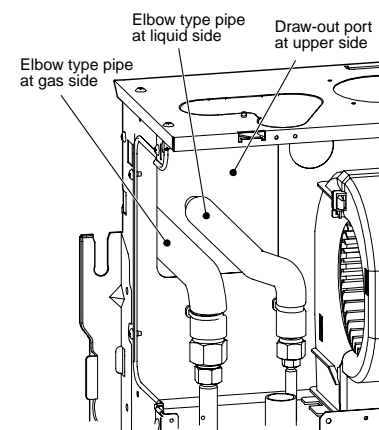


3. Removal of protective vinyl

Peel out the protective vinyl on the level flap.

4. Removal of protector

Remove the protectors (2 pcs.) of the fan. (RAV-SM801CT only)



Tightening connection

CAUTION

- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

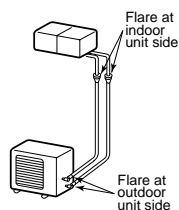
(Unit : N•m)

Outer diam. of copper pipe	Tightening torque
6.4 mm (diam.)	14 to 18 (1.4 to 1.8 kgf•m)
9.5 mm (diam.)	33 to 42 (3.3 to 4.2 kgf•m)
12.7 mm (diam.)	50 to 62 (5.0 to 6.2 kgf•m)
15.9 mm (diam.)	68 to 82 (6.8 to 8.2 kgf•m)

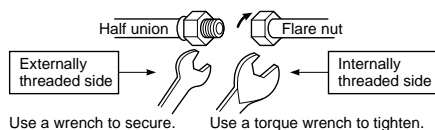
• Tightening torque of flare pipe connections

Pressure of R410A is higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque.

Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.



Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



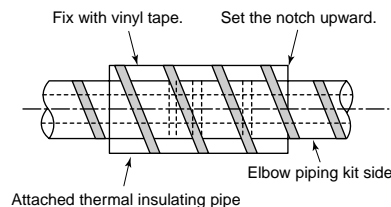
Thermal insulating process

Apply thermal insulation to pipes at liquid and gas sides separately.

- Be sure to use thermal insulator with heat resisting temperature 120°C or more for pipes at gas side.
- Using thermal insulators attached to the indoor unit and Elbow piping kit, apply thermal insulating process surely to pipe connecting section without clearance.

CAUTION

Apply thermal insulating process surely so that no exposure cannot be found up to the end of the pipe connecting section of the indoor unit. (If a part of the pipe is exposed, leakage may be caused.)

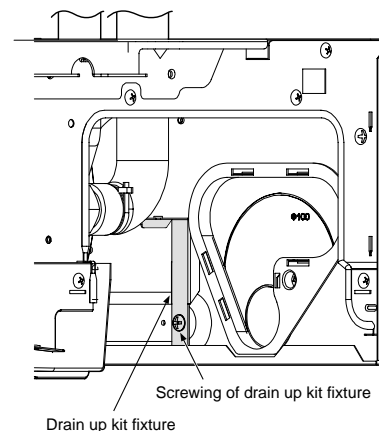


For the connection of refrigerant pipe and thermal insulating process after hanging down the indoor unit, refer to the Installation Manual attached to the indoor unit.

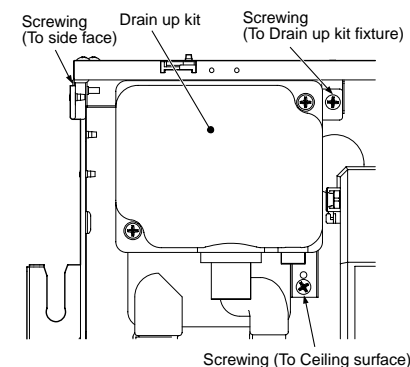
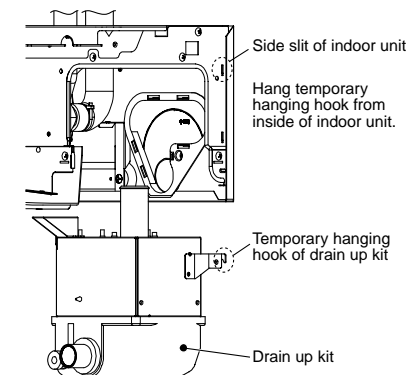
3 INSTALLATION PROCEDURE OF DRAIN-UP KIT

How to install drain up kit

- Mount the drain up kit fixture to the rear side inside of the indoor unit. (1 screw)

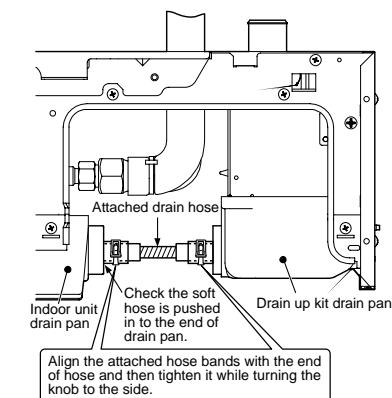


- Hang the temporary hanging hook of the drain up kit to the side slit of the indoor unit from inner side. Screw the drain up kit to the indoor unit. (3 screws: Ceiling surface, side face, and drain up kit fixture)



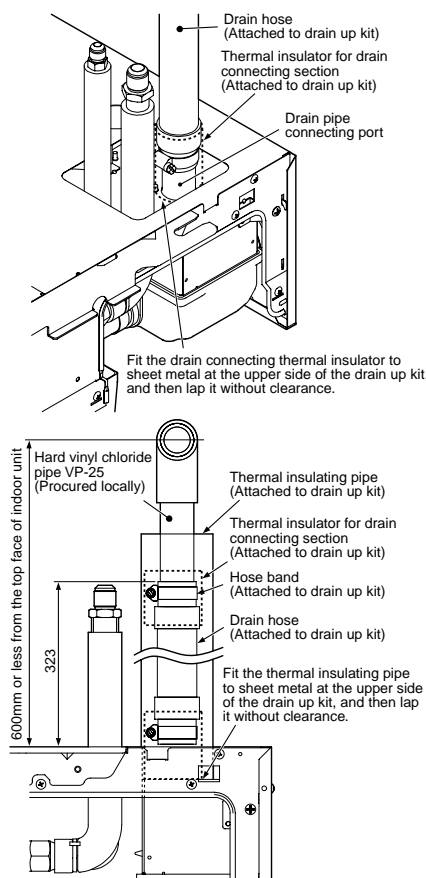
Connection of drain hose at indoor unit side

1. Insert the drain hose attached to the indoor unit into the drain pipe connecting port of the indoor unit's and into the drain pipe connecting port of the drain up kit's drain pan.
In this time, insert the drain hose until it strikes on the connecting port of the drain pipe.
2. Align the hose band attached to the indoor unit with the end of pipe connecting port, and then tighten it firmly.
3. Cut off (to 160 × 200) the thermal insulator (200 × 200) for drain hose attached to the indoor unit. Using it, lap the connecting section of drain pan and drain hose without clearance, and then tighten it with two banding bands attached to the indoor unit so that thermal insulator does not open.



Connection of drain hose at drain up kit side

1. Insert the drain hose attached to the drain up kit into the connecting port of drain pipes at the upper side of the drain up kit.
2. Align the hose band attached to the drain up kit with the end of pipe connecting port, and then tighten it firmly.
3. Fit the drain connecting thermal insulator attached to the drain up kit to sheet metal at the upper side of the drain up kit, and then lap it covering the drain hose without clearance.



* When using the drain hose within 150mm or less from the top face of the indoor unit, do not use an elbow but connect the attached drain hose directly, which was bent (with larger round as possible as you can).

4 DRAIN PIPING WORK

CAUTION

- Following the Installation Manual, perform the drain piping work so that water is properly drained, and apply a heat insulation so as not to cause a dew. Inappropriate piping work may result in water leakage in the room and wet of furniture.

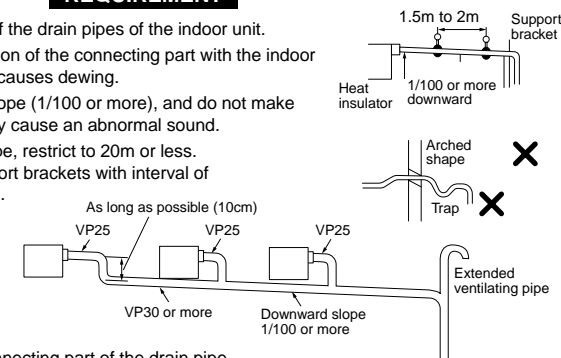
Piping/Heat insulating material

Require the following materials for piping and heat insulating at site.

Piping	Hard vinyl chloride pipe VP25 (Outer dia. : Ø32mm)
Heat insulator	Foam polyethylene : Thickness 10mm or more

REQUIREMENT

- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dewing.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 20m or less. In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.
- Set the collective piping as shown in the right figure.
- Be sure not to apply force to the connecting part of the drain pipe.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit. For connection with the drain pipe connecting port, be sure to use/fix the attached flexible hose with the hose band, otherwise a damage or water leak is caused on the drain pipe connecting port.



Adhesive inhibited :

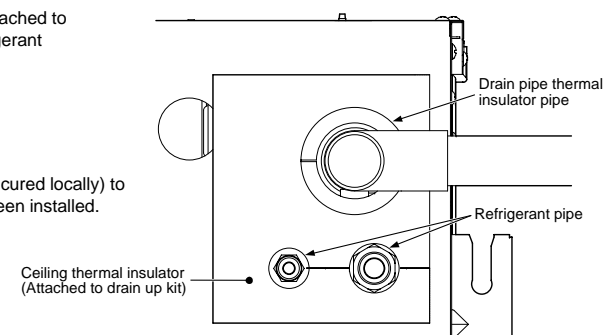
Use the attached flexible hose and hose band for connecting the drain hose to the drain piping connecting part. If applying the adhesive, socket will be damaged and cause water leakage.

5 THERMAL INSULATOR FOR CEILING PLATE

Adhere the ceiling thermal insulator attached to the drain up kit to positions of the refrigerant pipe and the drain pipe.

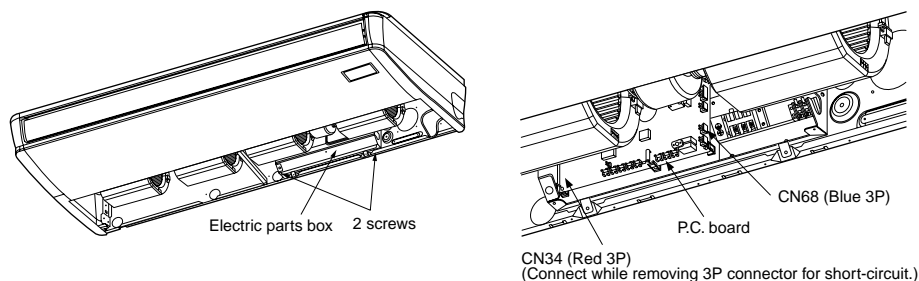
Connection of drain pipe

- Connect hard vinyl chloride pipe (procured locally) to the attached drain hose which has been installed.



6 CABLE CONNECTION

1. Loosen the mounting screws (2 positions) of the cover of the electric parts box, and then remove the cover.
2. In the drain up kit, connect the connector (Blue 3P) for drain pump to P.C. board CN68 (Blue 3P) of the indoor unit, and the connector (Red 3P) for float switch to P.C. board CN34 (Red 3P) of the indoor unit respectively.
In this time, remove 3P connector (Red 3P) for short-circuit of CN34 (Red 3P).



7 TEST RUN

Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes.

Be sure to check draining also when installed in heating period.

Using a pitcher or hose, pour water (1200cc) into the discharge port before installation of the ceiling panel. Pour water gradually so that water does not spread on the motor of the drain pump.

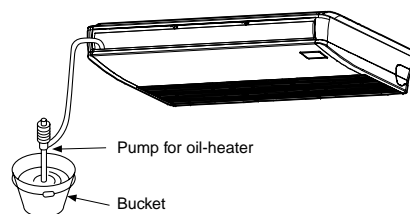
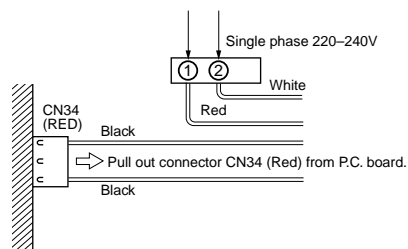
- After the electric work has finished, pour water during COOL mode operation.
- If the electric work has not yet finished, pull out the float switch connector (CN34 : Red) from the electric parts box, and check draining by plugging the single phase 220~240V power to the terminal blocks] and O.

If doing so, the drain pump motor operates.

- Test water drain while checking the operation sound of the drain pump motor.
(If the operation sound changes from continuous sound to intermittent sound, water is normally drained.)

After the check, the drain pump motor runs, connecting the float switch connector.

(In case of check by pulling out the float switch connector, be sure to return the connector to the original position.)



TOSHIBA

INSTALLATION MANUAL

Drain-up Kit for Concealed Duct Type Indoor Unit

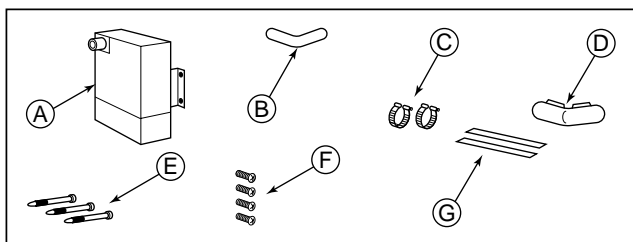
MODEL: TCB-DP11BE

WARNING

- Ask the qualified installation professional to install the drain up kit. If drain up kit is inappropriate installed by yourself, it may cause a water leak, an electric shock fire and so on.
- Install the drain up kit surely according to this installation manual.
- When re-install the drain up kit, also ask the qualified installation professional to install it. If drain up kit is installed by yourself, it may cause a water leak, an electric shock fire and so on.

Configuration

	Name	Q'ty		Name	Q'ty
A	Drain up kit body	1	E	Bundling band	3
B	Drain hose	1	F	Tapping screw	4
C	Hose band	2	G	Thermal insulation tape	2
D	Thermal insulation pipe	1			



REQUIREMENT

- Be sure to install the drain up kit correctly according to the procedure described in this Installation Manual. Otherwise, the position of the drain pan on the drain up kit does not match with one on the air conditioner body, resulting in a water leak.
- Check the level of the air conditioner. (Check that it is horizontally set or the drain port side of the air conditioner is set with an inclination within 1° downward.)
- Be sure to make a check port to the lower ceiling part of the drain up kit.

How to install drain-up kit

1. Installation of drain-up kit body (See Fig. 1.)

Open the cover of drain-up kit body, align the position and fasten the body using the attached 4 tapping screws.

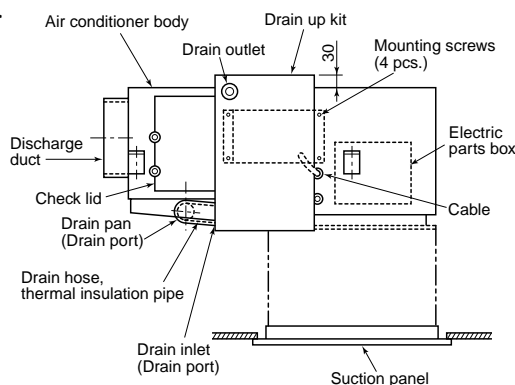
2. Hose connection (See Fig. 1.)

- First connect the drain hose to pipe at the drain port of the drain up kit, and then connect it to the drain port of the air conditioner body.
- Tighten the both ends of the drain hose with hose band. In this time, be sure to set the screw section of the hose band toward upper side.
- Apply thermal insulation the drain hose with the attached thermal insulation pipe.
- Set the both ends of the drain hose closely to the drain pan.
- If a gap is generated on the matched section of the thermal insulation materials at the both ends, seal the section by winding the thermal insulation tape.

3. Drain piping

- Be sure to set the drain pipe from the drain up kit with falling gradient.
- Support and fix the drain pipe at an appropriate position so that an excessive load is not applied on the drain port.
- Be sure to apply thermal insulation (procured locally) to the drain pipe.

<Fig. 1>

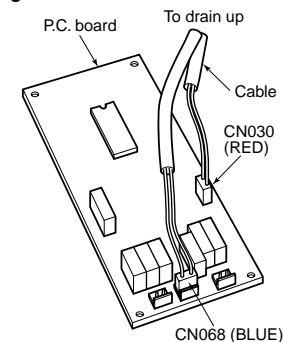


* Using the hose band, tighten the drain port and drain inlet of the drain pan. Also, be sure to set the screw section of the hose band toward upper side.

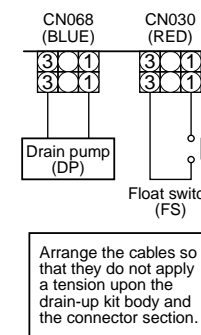
4. Cabling (See Fig. 2.)

- Remove cover of the electric parts box of the air conditioner body.
- Insert 3P connector (BLUE) of the drain up kit into the terminal No. CN068 (BLUE) in the electric parts box.
- Remove the short circuit connector (No. CN030) on the P.C. board in electric parts box.
- Insert 3P connector (RED) of the drain up kit into the terminal No. CN030 (RED) (Short-circuit connector is not used.)
- Clamp the cable in the electric parts box.

<Fig. 2>



<Fig. 3>



Test run

Condition check of water drain

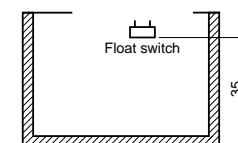
After the electric work and cabling work, check the drain is smoothly discharged by running the air conditioner in COOL mode.

- If the cooling operation does not continue for a long time, pour water into the drain pan of the air conditioner body to check whether the drain is smoothly discharged or not.
- Check there is no water leak at each connecting section.

Operation check of float switch

- During cooling operation, operate the float switch. Check the air conditioner stops the cooling operation under condition that the drain pump keeps operating.
- After operation in COOL mode, operate the float switch. In this time, check that the drain pump works to discharge the drain.

<Position of float switch>



- To handle the float switch, remove the front panel of the kit and push up the floating section of the float switch with a screwdriver, etc.
- Be careful not to operate the float switch consecutively for 2 minutes or more because the air conditioner stops abnormally.

Maintenance/Check

In order to put the function of the air conditioner and the drain-up kit fully to practical use, the regular maintenance and check are necessary, together with correct usage.

For the air conditioner body and the drain-up kit especially, **check dirt of the drain pan once per year before cooling season and clean them if dirt is heavy.**

- It is recommended to make a contract with the customers for maintenance and check.

EH99824201 (EN)

TOSHIBA INSTALLATION MANUAL

Network Adapter for Air Conditioner

Use for Indoor Unit Only
MODEL : TCB-PCNT20E

[For Installation Professionals]

- Thank you for purchasing the parts sold separately for TOSHIBA package air conditioner.
- Before installation work, please read this manual thoroughly and install the products correctly.
- Ensure that all Local, National and International regulations are satisfied.
- Read this "CAUTION SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety.

CAUTIONS for SAFETY

WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
Do not store it in a wet basement or expose to rain or water.

CAUTION

- Using the specified cables, surely so that the external force of the cable is not transmitted to the terminal connecting section, otherwise disconnection, heating, or fire may be caused.
- Do not apply an excessive force on the board body, otherwise bending, separation, or disconnection generates resulted in heating or fire.

- After installation work, execute a test run to confirm there is no trouble.
And also ask the customers to keep this Manual by themselves.

■ Components

Part name	Q'ty	Description
P.C. board	1	P.C. board corresponded to the network
Relay terminal block	1	2P (X, Y) terminal block for relay
Relay cable (A)	1	For connection of adapter board with X, Y relay terminal block (Red connector)
Relay cable (B)	1	For connection of adapter board with remote controller terminal block (Blue connector)
Installation Manual	1	This manual
Spacer (A)	2	For fixing the adapter P.C. board (Used for other types than 4-way cassette type)
Spacer (B)	1	For fixing the adapter P.C. board (Used for other types than 4-way cassette type)
Spacer (C)	3	For fixing the adapter P.C. board (Used for 4-way cassette type)
Screws to fix terminal block	2	For fixing the relay terminal block (M4 x 14 ℓ)
Transformer cover	1	Used to store transformer (For 4-way cassette type)
Transformer base	1	Used to store transformer (For 4-way cassette type)
Transformer	1	For supplying power to adapter
Screws to fix transformer	2	For fixing transformer (M3 x 6 ℓ)
Screws to assemble transformer cover	2	For assembling transformer cover (M4 x 6 ℓ for 4-way)
Screws to fix transformer base	2	For fixing transformer base (M4 x 10 ℓ for 4-way)
Bundling band	3	Used to process cables so that they are not caught in.

■ Combination List of Adapter Parts

	Parts	For 4-way type	For Concealed duct type
1	Adapter P.C. board	3 spacers (C) for installing P.C. board	2 spacers (A) for installing P.C. board 1 spacer (B) for installing P.C. board
2	Transformer	M3 x 6 B tight screw (2 pcs.)	M3 x 6 B tight screw (2 pcs.)
3	For assembling transformer cover	M4 x 6 tapping screws (2 pcs.)	—
4	For fixing transformer base	M4 x 10 plus tight screws (2 pcs.)	—
5	XY terminal block	M4 x 14 tapping tight screws (2 pcs.)	M4 x 14 tapping tight screws (2 pcs.)
6	Adapter P.C. board to XY terminal block	Connector, red color, lead length : 600L	Connector, red color, lead length : 600L
7	Adapter P.C. board to AB terminal block	Connector, blue color, lead length : 600L	Connector, blue color, lead length : 600L

* Spacer (A) for installing P.C. board : Spacer to be mounted by using the hole on the P.C. board.
(For other types than 4-way cassette type)

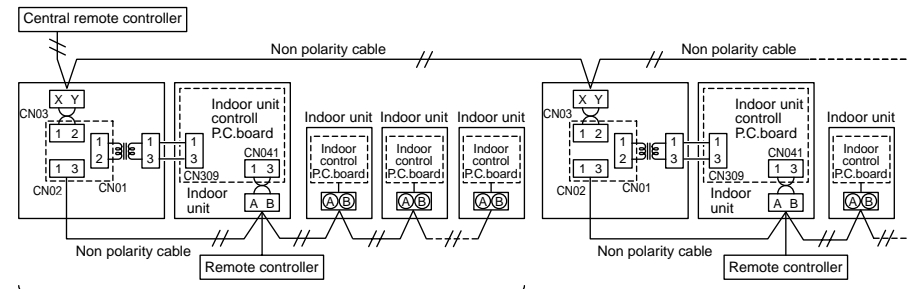
Spacer (B) for installing P.C. board : Spacer to be mounted by pinching it in the P.C. board.
(For other types than 4-way cassette type)

Spacer (C) for installing P.C. board : Spacer to be mounted by using the hole on the P.C. board for 4-way cassette type.

Connection of Cables

1. Connection of network cables

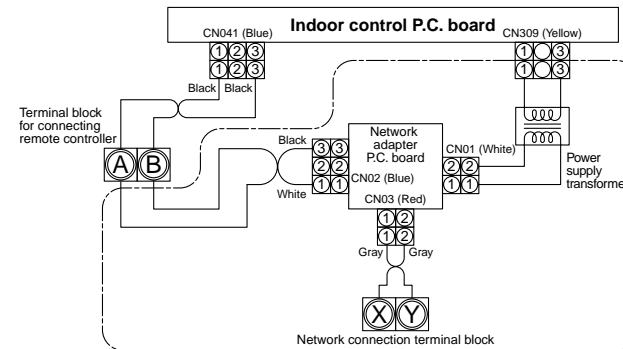
- Attach one network adapter to a group of one group controlling (including one unit).
Connect the network adapter to any one of the indoor units in the group control.



Connectable indoor units per group : Up to 8 units (In case of 1-remote controller system*)
* In case of 2-remote controllers system, up to 7 indoor units are allowable to be connected.

2. Cabling diagram of indoor control P.C. board

- For details, see the installation procedure for individual model.



- The enclosed section with the chain line includes the attached parts.
- There is no polarity for cabling to the terminal blocks, A, B and X, Y.
- Arrange the total cable length of the remote controller cable and the inter-unit cable of the remote controller within 400m.

Installation Procedure

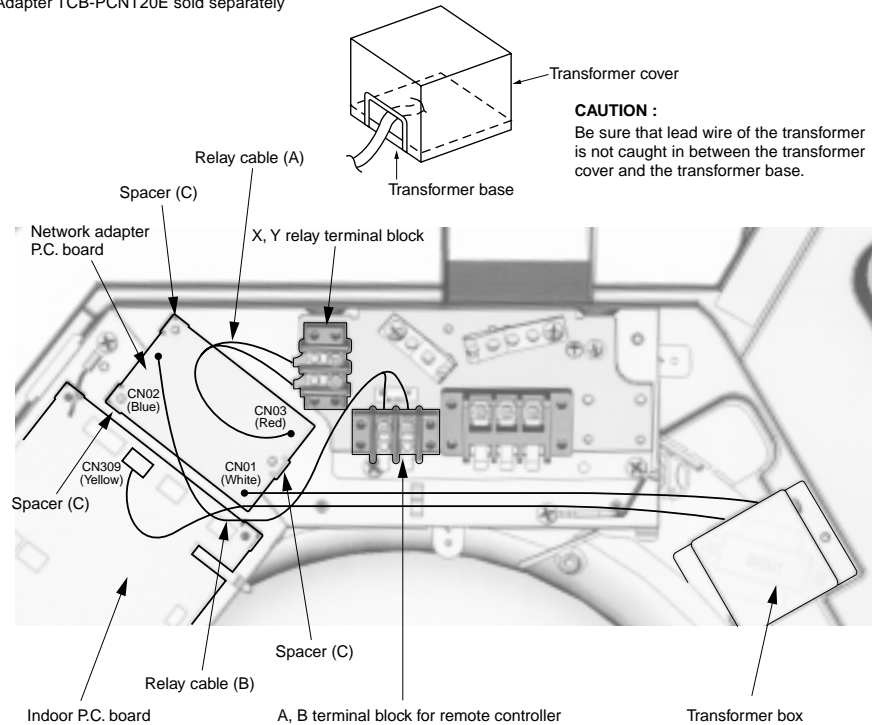
- For installation of the adapter P.C. board and removal of the relay cable, be sure to wait for a while (approx. 1 minute) after turning off the power supplies of the air conditioner and the collective control remote controller. If not doing so, the adapter P.C. board may be damaged.

■ In case of 4-way Ceiling Cassette (RAV-SM **0 UT-E)

No.	Procedure
1	Using the spacer (C), install the adapter P.C. board to the position of the electric parts box of the indoor unit.
2	Using the 2 pcs. Ø4 x 14 l tapping tight screws, install X, Y relay terminal block to the position of the electric parts box. • When tightening the screws, be sure not to damage the cable.
3	Using 2 pcs. Ø4 x 6 l tapping screws, install the transformer box storing the transformer to the position at side of the bell mouth.
4	Using the relay cable (A), connect the X, Y relay terminal block with CN03 (Red) of the adapter P.C. board, and remote controller terminal block (A, B) with CN02 (Blue) of the adapter P.C. board using the relay cable (B), respectively. Perform cabling between the yellow connector of the transformer and CN309 of the adapter P.C. board, and between white connector to CN01 of the adapter P.C. board, respectively.

Details

Adapter TCB-PCNT20E sold separately



* To install the adapter P.C. board to the electric parts box, put 3 pcs. spacer (C) into the hole of the P.C. board.

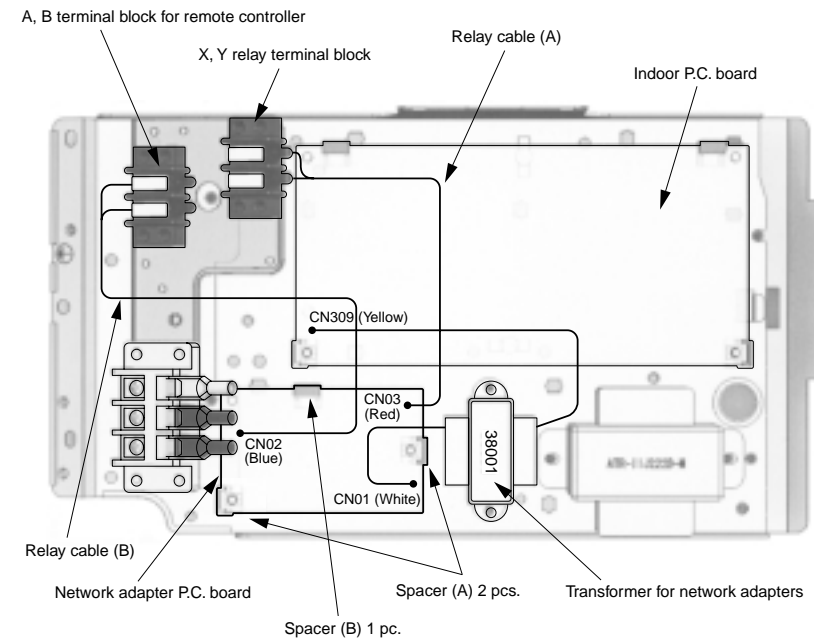
* After connection of the relay cables (A) and (B), fix them along the neighboring cables with bundling band so that cables are not caught.

■ In case of Concealed Duct (RAV-SM **0 BT-E)

No.	Procedure
1	Using the spacer (A) and (B), install the adapter P.C. board to the position of the electric parts box.
2	Using the 2 pcs. Ø4 x 14 l tapping tight screws, install X, Y relay terminal block to the position of the electric parts box of the indoor unit. • When tightening the screws, be sure not to damage the cable.
3	Using 2 pcs. Ø3 x 6 l B-tight screws, install the transformer to the position of the electric parts box of the indoor unit.
4	Using the relay cable (A), connect the X, Y relay terminal block with CN03 (Red) on the adapter P.C. board, and remote controller terminal block (A, B) with CN02 (Blue) on the adapter P.C. board using the relay cable (B), respectively. Perform cabling between the yellow connector of the transformer and CN309 on the indoor P.C. board, and between white connector and CN01 on the adapter P.C. board, respectively.

Details

Adapter TCB-PCNT20E sold separately



- Relay cable (A): Connection between X, Y terminal block and CN03 on the adapter P.C. board
- Relay cable (B): Connection between terminal block of the remote controller and CN02 on the adapter P.C. board

* To install the adapter P.C. board to the electric parts box, put 2 pcs. spacers (A) into the hole of the P.C. board (At upper side and at lower right side of the P.C. board), and install one of them to the electric parts box (At lower left side of the P.C. board) using the board installing spacer (B) of a type which pinches the P.C. board.

* After connection of the relay cables (A) and (B), fix them along the neighboring cables with bundling band so that cables are not caught.

Setup of the Address No.

To connect the indoor unit to the central remote controller using the adapter, it is necessary to set up the network address No.

- It is required to agree the network address No. with the central remote controller system No.
- The network address No. is set to 1 at the shipment from the factory.

The following two methods are used for setup.

1. Setup from the remote controller at the indoor unit side

- This method is available only when [7] of the setup switch SW01 on the adapter P.C. board is OFF.

<Procedure> Set up the address No. while the air conditioner stops.

1 Push and buttons for 4 seconds or more.

In case of the group control, the unit No. *ALL* is displayed, and then all the indoor units in the group control are selected. (Fig. 1)

In this time, the fans of all the selected indoor units start and the swing operation also starts in the models with flaps.

(Keep the display status of *ALL* without pushing button.)

In case of individual remote controller with no group control, the system address and the indoor unit address are displayed.

2 Using / buttons, specify the item code 03.

3 Using / buttons, select the setup data.

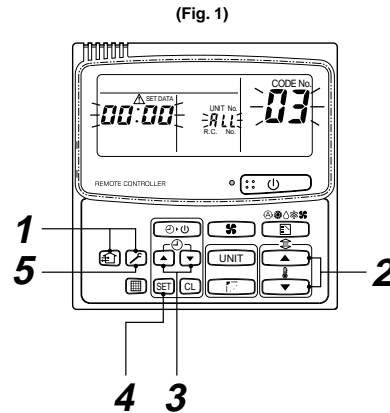
The following table shows the setup data. (Table 1)

4 Push button. (When the display goes on, the setup data is accepted.) To change the setup item, return to the step 2.

5 Push button. The status returns to the normal stop status.

(Table 1)

Setup data	Network address No.
0001	1
0002	2
0003	3
⋮	⋮
0064	64
0099	No setting (Shipment from the factory.)



2. Setup by the switch on the adapter P.C. board

When the remote controller is not found, or when you do not want to change the setup of network address No. on the remote controller, set up the address No. by using the setup switch SW01 (Network address No. setup switch) on the adapter P.C. board.

<Procedure>

1 Turn off the power supply.

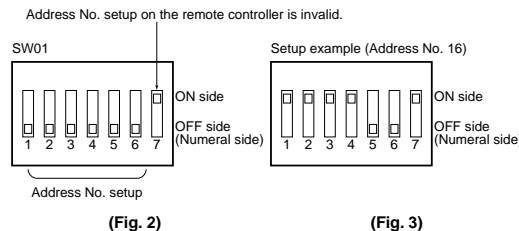
2 Set [7] of the address No. setup switch SW01 to ON side.

Accordingly, the setup of the address No. from the remote controller is invalidated. (Fig. 2)

3 The network address No. is set up by combining ON/OFF of the address No. setup switch, from SW01 [6] to [1].

For the relation between ON/OFF combination and the address No., see (Table 2).

A case when the address No. is set to 16 is shown in (Fig. 3).



■ Address No. setup table (SW01)

(Table 2)

○ : ON side, × : OFF side

Address No.	①	②	③	④	⑤	⑥
01	×	×	×	×	×	×
02	○	×	×	×	×	×
03	×	○	×	×	×	×
04	○	○	×	×	×	×
05	×	×	○	×	×	×
06	○	×	○	×	×	×
07	×	○	○	×	×	×
08	○	○	○	×	×	×
09	×	×	×	○	×	×
10	○	×	×	○	×	×
11	×	○	×	○	×	×
12	○	○	×	○	×	×
13	×	×	○	○	×	×
14	○	×	○	○	×	×
15	×	○	○	○	×	×
16	○	○	○	○	×	×
17	×	×	×	×	○	×
18	○	×	×	×	○	×
19	×	○	×	×	○	×
20	○	○	×	×	○	×
21	×	×	○	×	○	×
22	○	×	○	×	○	×
23	×	○	○	×	○	×
24	○	○	○	×	○	×
25	×	×	×	○	○	×
26	○	×	×	○	○	×
27	×	○	×	○	○	×
28	○	○	×	○	○	×
29	×	×	○	○	○	×
30	○	×	○	○	○	×
31	×	○	○	○	○	×
32	○	○	○	○	○	×

Address No.	①	②	③	④	⑤	⑥
33	×	×	×	×	×	○
34	○	×	×	×	×	○
35	×	○	×	×	×	○
36	○	○	×	×	×	○
37	×	×	○	×	×	○
38	○	×	○	×	×	○
39	×	○	○	×	×	○
40	○	○	○	×	×	○
41	×	×	×	○	×	○
42	○	×	×	○	×	○
43	×	○	×	○	×	○
44	○	○	×	○	×	○
45	×	×	○	○	×	○
46	○	×	○	○	×	○
47	×	○	○	○	×	○
48	○	○	○	○	×	○
49	×	×	×	×	○	○
50	○	×	×	×	○	○
51	×	○	×	×	○	○
52	○	○	×	×	○	○
53	×	×	○	×	○	○
54	○	×	○	×	○	○
55	×	○	○	×	○	○
56	○	○	○	×	○	○
57	×	×	×	○	○	○
58	○	×	×	○	○	○
59	×	○	×	○	○	○
60	○	○	×	○	○	○
61	×	×	○	○	○	○
62	○	×	○	○	○	○
63	×	○	○	○	○	○
64	○	○	○	○	○	○

Requirement in Service Time

When using this product as the service part for change of the adapter P.C. board, be sure to set the setup switch SW01 (Network address No. setup switch) on the adapter P.C. board so that it is same as one before change.

When the network address No. has been changed, turn on the power of the central remote controller again or reset the central remote controller from the reset hole on the control panel of the central remote controller.

To Customers

◆◆ Cautions in using the remote controller ◆◆

- After all the power supplies of the air conditioner have been turned on, turn on the power supply of the central remote controller. (16-systems : RBC-CR1-PE, 64-systems : RBC-CR64-PE)
If the power supplies of the air conditioner and the remote controller are turned on at the same time, or if they are turned on in reverse order, the check code [97] may be temporarily displayed on the central remote controller. When the connection cabling and setup of the central address are correct, the connected air conditioner is displayed on the central remote controller.
- As described below, there are differences of the display on LCD and the individual restrictions for the operation in the handy remote controller (RBC-AMT21E) and the central remote controller.

	Item	Contents		Cautions
		Main remote controller	Central remote controller	
1	Fan speed select			Display of air speed selection differs.
2	Fan speed select in FAN mode			When operating the main remote controller, is not displayed. If selecting at the central side, is displayed on the main remote controller. In this time, the air speed is .
3	Fan speed select in DRY mode			only is displayed on the central remote controller. is displayed on the main remote controller even by change of the setup temperature/louver, and the air speed changes automatically.
4	Air direction adjustment	and air direction adjustment	[LOUVER]	[LOUVER] only is displayed on the central remote controller. [LOUVER] is displayed when the flap is swinging, and ON and OFF of the swing operation set to the louver are exchanged.
		(No display)	[LOUVER] Manual	Set the air direction on the main remote controller.
5	Check button	Test run (4 seconds)	Display of check code and Check reset (3 seconds)	In case of type without function of air direction adjustment The function differs when the button is pushed for a long time. If the central remote controller-ON is reset during operation of the air conditioner, the operation stops temporarily, and then the operation is resumed. (Trouble of the air conditioner is cleared.)
6	Check code	Display with 3 digits (Alphabet + 2 digits numerals)	Display with 2 digits (Alphabet or numerals)	The display of the check code differs. Ex.) Float switch operation Main side : [P10], Collective side : [0b]

- When using the remote controller with the former remote controller (RBC-AM1E, AT1E), if Last-push priority/Center/Locked is selected on the central remote controller, the display differs on the main remote controller

	Item	Contents		Remarks
		New remote controller (RBC-AMT21E)	Former remote controller (RBC-AM1E, AT1E)	
1	Last-push priority	(No display)	(No display)	All the setups and Start/Stop operation are available.
2	Center	CENTER goes on.	CENTER goes on.	The setup contents of the central remote controller are fixed, and the Start/Stop operation and timer operation are available on the main remote controller.
3	Locked		CENTER flashes.	The setup contents of the central remote controller are fixed, and the air conditioner stops. The operation on the main remote controller is unavailable.

* Before using the remote controller, read the Owner's Manual thoroughly to use it correctly.

EH99774901-① (EN)

INSTALLATION MANUAL

ELBOW PIPING KIT

TCB-KP12CE TCB-KP22CE

PIPlease read this Installation Manual carefully before installing the Air Conditioner.

- This Manual describes the installation method of the indoor unit.
- For installation of the outdoor unit, follow the Installation Manual attached to the outdoor unit.

EH99832201

1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem. Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

CAUTION

New Refrigerant Air Conditioner Installation

- THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION

To Disconnect the Appliance from Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (25A D type ) must be used for the power supply line of this conditioner.

⚠ WARNINGS




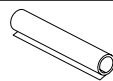
- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
Do not store it in a wet basement or expose to rain or water.

2 ELBOW PIPING KIT

CAUTIONS

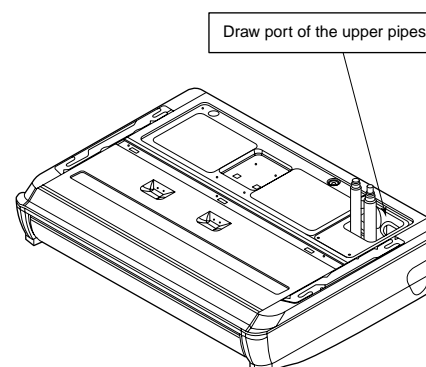
- For details of installation work, refer to the Installation Manual attached to the indoor unit.
- When installing this kit together with a drain up kit (TCB-DP22CE), refer to the Installation Manual attached to the drain up kit.
- Please preserve this Manual with the Owner's Manual of the indoor unit.

Parts List

Name	Shape	Q'ty
Elbow type pipe (Gas side)		1
Elbow type pipe (Liquid side)		1
Pipe thermal insulator (Gas side)		1
Pipe thermal insulator (Liquid side)		1

Before Installation

Before installation, open the draw port of the upper pipes. (Sheeted knockout hole)



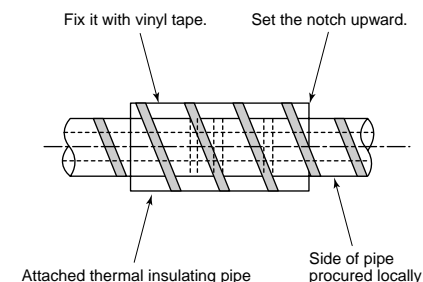
Connection of Pipes

- Be sure to use a double spanner to connect the pipes.
- Using a torque wrench, tighten surely with the specified tightening torque the connecting section of flare pipes which connect each unit of the indoor and outdoor units. For the tightening torque, see the following table.

Outer dia. of connecting pipe (mm)	Tightening torque (N-m)
Ø6.4	14 to 18 (1.4 to 1.8kgf-m)
Ø9.5	14 to 18 (1.4 to 1.8kgf-m)
Ø12.7	14 to 18 (1.4 to 1.8kgf-m)
Ø15.9	14 to 18 (1.4 to 1.8kgf-m)

Thermal Insulating Process

- Apply thermal insulation to pipes at liquid side and gas side separately.
- Using thermal insulators attached to this part and the indoor unit, apply thermal insulation to connecting section of the pipes surely without clearance.



TOSHIBA

Concealed Duct type

Zeolite-3G Deodorant Filter

Installation Manual



Model: TCB-FPC11BE
TCB-FPC21BE
TCB-FPC31BE
TCB-FPC41BE

NOTES

- Do not unpack the filter until you use it.
(Otherwise, life of the Zeolite-3G deodorant filter is shortened.)
- Keep this Manual with Owner's Manual of the indoor unit.

Safety Cautions

- Before installation work, read thoroughly this "Safety Cautions" to install the air conditioner correctly.
- This "Safety Cautions" describes the important contents concerned to the safety. Be sure to keep in mind these items. Symbols and meanings are as described below.







	WARNING	Indicates "User may be dead or seriously injured (*1) if it is incorrectly used."
	CAUTION	Indicates "It is assumed that user may be injured (*2) or property damage (*3) may occur if it is incorrectly used."

*1: "Serious injury" means a disease which has an after-effect or requires hospitalization or long-term going to the hospital for treatment, such as loss of sight, burn (by high temperature or low temperature), electric shock, fracture, poisoning, etc.

*2: "Injury" means hurt, burn, electric shock, etc. which does not require hospitalization or long-term going to the hospital for treatment.

*3: "Property damage" means enlarged damage concerned to house, household effects, domestic animal, pet, etc.

Explanation of picture symbols

	 indicates prohibition (prohibited action). The concrete prohibited action is indicated with picture or sentence in or near the picture symbol.
	 indicates that the forced instructed action (Act necessarily). The concrete instructed action is indicated with picture or sentence in or near the picture symbol.
	 indicates an item with care. The concrete item to be cautioned is indicated with picture or sentence in or near the picture symbol.

WARNING

- Do not put a plastic bag including filter on a place where hands of a small child can reach.
If the child puts the bag on his head, it may seal his mouth or nose resulting in choke of death.



CAUTION

- Install the suction grille surely to the main unit.
If an incomplete installation is performed, falling of the suction grille causes an injury.

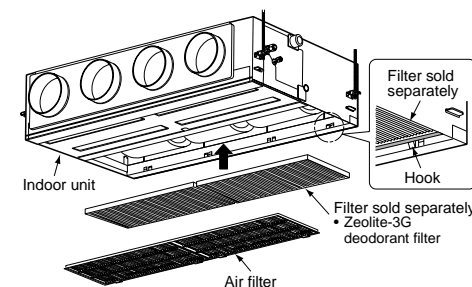


Specifications

Deodorant filter	Model	TCB-FPC11BE	TCB-FPC21BE	TCB-FPC31BE	TCB-FPC41BE
Conformed air conditioner model name	—	561BT	801BT	1101 to 1401BT	
Quantity	1	1	2	2	
Initial deodorant performance	70%				
Deodorant durable performance	Approx. 12 months				

Installation of filter sold separately

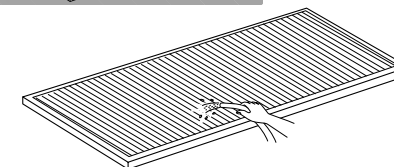
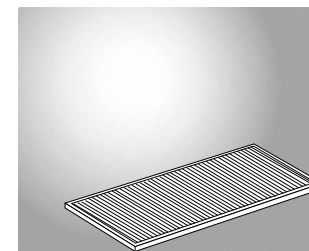
- Remove the air filter, and install a filter sold separately to the suction port.**
Push the filter sold separately completely up to the end.
Check that the rear side is hanged to the hook.
- Install the air filter**
Be sure to fix the air filter with clamps in order to prevent falling.
(Clamps are attached to the indoor unit.)



Maintenance of filter sold separately

- Clean the filter sold separately once per 6 months.

- Take out the filter sold separately in the reverse order of "Installation of filter sold separately".**
- Cleaning of the filter sold separately**
Sweep away the dust of the filter sold separately by hitting lightly and dry it in the sunlight for 6 hours or more.
In case of wash the filter sold separately with water
Put the filter sold separately horizontally on a place where is exposed to the sunlight, and then wash it with running water such as shower.
After then, leave it as it is until it will dry. In this time, also dry it in the sunlight for 6 hours or more.



- Install the air filter.**
Based upon "Installation of filter sold separately", install the filter.

NOTE

If treating the filter as it gets wet, it may be damaged.

TOSHIBA CARRIER CORPORATION

FPBE-E

TCB-FPC11, 21BE
TCB-FPC31, 41BE

TOSHIBA

Concealed Duct type

High-Efficiency Filter

High-Efficiency filter (65%)

Installation Manual

Model: TCB-UFM11BE
TCB-UFM21BE
TCB-UFM31BE
TCB-UFM41BE

High-Efficiency filter (90%)



Model: TCB-UFH51BE
TCB-UFH61BE
TCB-UFH71BE
TCB-UFH81BE

NOTES

- For installation of the filter, refer to the rear side of this manual.
- Keep this Manual with Owner's Manual.

Safety Cautions

- Before installation work, read thoroughly this "Safety Cautions" to install the air conditioner correctly.
- This "Safety Cautions" describes the important contents concerned to the safety. Be sure to keep in mind these items. Symbols and meanings are as described below.







 WARNING	Indicates "User may be dead or seriously injured (*1) if it is incorrectly used."
 CAUTION	Indicates "It is assumed that user may be injured (*2) or property damage (*3) may occur if it is incorrectly used."

*1: "Serious injury" means a disease which has an after-effect or requires hospitalization or long-term going to the hospital for treatment, such as loss of sight, burn (by high temperature or low temperature), electric shock, fracture, poisoning, etc.

*2: "Injury" means hurt, burn, electric shock, etc. which does not require hospitalization or long-term going to the hospital for treatment.

*3: "Property damage" means enlarged damage concerned to house, household effects, domestic animal, pet, etc.

Explanation of picture symbols

	 indicates prohibition (prohibited action). The concrete prohibited action is indicated with picture or sentence in or near the picture symbol.
	 indicates that the forced instructed action (Act necessarily). The concrete instructed action is indicated with picture or sentence in or near the picture symbol.
	 indicates an item with care. The concrete item to be cautioned is indicated with picture or sentence in or near the picture symbol.

WARNING

- Do not put a plastic bag including filter on a place where hands of a small child can reach.
If the child puts the bag on his head, it may seal his mouth or nose resulting in choke of death.

CAUTION

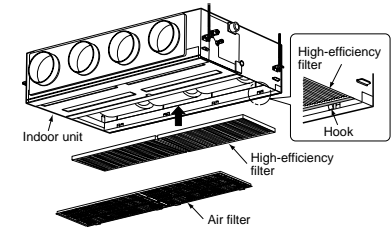
- Install the suction grille surely to the main unit.
If an incomplete installation is performed, falling of the suction grille causes an injury.

Specifications

High-efficiency filter (65%) model name	TCB-UFM11BE	TCB-UFM21BE	TCB-UFM31BE	TCB-UFM41BE	High-efficiency filter (90%) model name	TCB-UFH51BE	TCB-UFH61BE	TCB-UFH71BE	TCB-UFH81BE
Conformed air conditioner model name	—	561BT	801BT	1101BT to 1401BT	Conformed air conditioner model name	—	561BT	801BT	1101BT to 1401BT
Quantity	1	1	2	2	Quantity	1	1	2	2
Dust collecting effect	Color test 65%				Dust collecting effect	Color test 90%			
Operation time	2500 hours				Operation time	1800 hours			

Installation of high-efficiency filter

- Remove the air filter, and install high-efficiency filter to the suction port.**
Push the high-efficiency filter completely up to the end.
Check that the rear side is hanged to the hook.
- Install the air filter**
Be sure to fix the air filter with clamps in order to prevent falling.
(Clamps are attached to the indoor unit.)



NOTE

These filter cannot be reused even if it is washed.

To install a filter sold separately, be sure to set the fan referring the following description.

* The filter sold separately cannot be installed to an air conditioner built in with auxiliary electric heater.











Setup of fan when building in the high-efficiency filter:

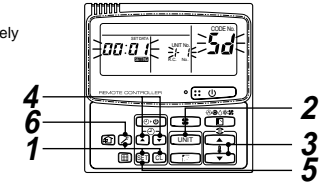
Necessary at initial installation only

Two methods are provided for setup, one is to use a wired remote controller sold separately and the other is to exchange the short plug on the indoor microcomputer P.C. board.

[Using a wired remote controller sold separately]

(Procedure) Perform the setup while the equipment stops.

- Push  +  +  buttons concurrently for 4 seconds or more.**
The firstly displayed unit No. is the master indoor unit address of the group control.
In this time, the fan of the selected indoor unit only operates.
- Every pushing  button, No. of the group control units are displayed in order.**
In this time, the fan of the selected indoor unit only operates.
- Using set temperature  and  buttons, specify the item code "5d".**
- Using timer time  and  buttons, select from the set data.**
For contents of the setup data, refer to the table at the right.
- Push  button.**
(When flashing display changes to lighting display, the setup completes.)
- Pushing  button returns the state to the normal stop state.**



* Setup can be performed only by the wired remote controller. If setup is not performed, air volume is decreased and dewing occurs.

Item code 5d

Set data	Filter sold separately
0000	Standard filter (At shipment)
0001	High-efficiency filter (65%) (TCB-UFM11BE to UFM41BE) High-efficiency filter (90%) (TCB-UFH51BE to UFH81BE)

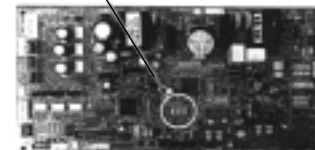
[Exchange of short plug on indoor microcomputer P.C. board]

To exchange the static pressure, there is a method other than the abovementioned method by wired remote controller, which is to shift the short plug on the indoor microcomputer P.C. board as shown in the following table. Adopt this method in case of using a wireless remote controller, etc.

* However, after exchanging once, be careful to shift the short plug to the standard position (At shipment) in order to return to the standard setup (follow to E2PROM setup) though the setup for high static-pressure 1, high static-pressure 2, or low static-pressure can be arbitrarily performed. It is necessary to rewrite data from the wired remote controller sold separately in the set data "0000".

- Select with shifting of the short plug on the indoor unit microcomputer P.C. board.

Short plug position (CN112, CN111, CN110 from the left)



*1 Resistance of high-efficiency filter 65 and 90, deodorant filter, or ammonium filter is equivalent to 30Pa. Therefore, set the resistance (external static pressure) of a duct to be connected to 40Pa.

Short plug position	External static pressure	Filter sold separately
Short Open		
CN112 CN111 CN110	40Pa Standard (At shipment)	Standard filter (At shipment) Zeolite-3G deodorant filter
CN112 CN111 CN110	70Pa High static-pressure 1	*1 High-efficiency filter 65 High-efficiency filter 90 Deodorant filter Ammonium filter
CN112 CN111 CN110	100Pa High static-pressure 2	—
CN112 CN111 CN110	20Pa Low static-pressure	—

TOSHIBA CARRIER CORPORATION

UFBE-E

TCB-UFM11, 21, 31, 41BE
TCB-UFH51, 61, 71, 81BE

TOSHIBA

Concealed Duct type

Deodorant Filter, Ammonium Filter Installation Manual

Deodorant Filter

Model: TCB-DF11BE
TCB-DF21BE
TCB-DF31BE
TCB-DF41BE

Ammonium Filter

Model: TCB-DF11BE-AM
TCB-DF21BE-AM
TCB-DF31BE-AM
TCB-DF41BE-AM

NOTES

- Do not unpack the filter until you use it. (Otherwise, life of the deodorant filter or ammonium filter is shortened.)
- Keep this Manual with Owner's Manual of the indoor unit.

Safety Cautions

- Before installation work, read thoroughly this "Safety Cautions" to install the air conditioner correctly.
- This "Safety Cautions" describes the important contents concerned to the safety. Be sure to keep in mind these items. Symbols and meanings are as described below.

	WARNING	Indicates "User may be dead or seriously injured (*1) if it is incorrectly used."
	CAUTION	Indicates "It is assumed that user may be injured (*2) or property damage (*3) may occur if it is incorrectly used."

*1: "Serious injury" means a disease which has an after-effect or requires hospitalization or long-term going to the hospital for treatment, such as loss of sight, burn (by high temperature or low temperature), electric shock, fracture, poisoning, etc.

*2: "Injury" means hurt, burn, electric shock, etc. which does not require hospitalization or long-term going to the hospital for treatment.

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		Indicates that the forced instructed action (Act necessarily). The concrete instructed action is indicated with picture or sentence in or near the picture symbol.
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WARNING

- Do not put a plastic bag including filter on a place where hands of a small child can reach.
If the child puts the bag on his head, it may seal his mouth or nose resulting in choke of death.

CAUTION

- Install the suction grille surely to the main unit.
If an incomplete installation is performed, falling of the suction grille causes an injury.

Specifications

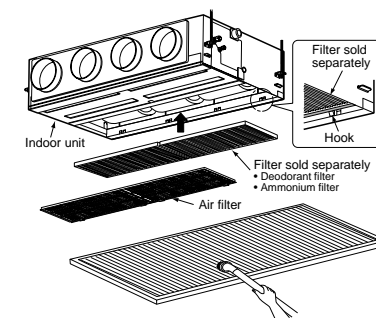
Deodorant filter model name	TCB-DF11BE	TCB-DF21BE	TCB-DF31BE	TCB-DF41BE	Ammonium filter model name	TCB-UFH11BE-AM	TCB-UFH21BE-AM	TCB-UFH31BE-AM	TCB-UFH41BE-AM
Conformed air conditioner model name	—	561BT	801BT	1101BT to 1401BT	Conformed air conditioner model name	—	561BT	801BT	1101BT to 1401BT
Quantity	1	1	2	2	Quantity	1	1	2	2
Initial deodorant performance	85%				Initial deodorant performance	95%			
Deodorant durable performance	Approx. 9 months				Deodorant durable performance	Approx. 15 months			

Installation of filter sold separately

- Remove the air filter, and install a filter sold separately to the suction port.**
Push the filter sold separately completely up to the end.
Check that the rear side is hanged to the hook.
- Install the air filter**
Be sure to fix the air filter with clamps in order to prevent falling.
(Clamps are attached to the indoor unit.)

NOTE

These filter cannot be reused even if it is washed.



Maintenance of filter sold separately

- Clean the filter sold separately once per 2 months.
- Take out the filter sold separately in the reverse order of "Installation of filter sold separately".**
 - Sweep away the dust of the filter sold separately with a cleaner.**
 - Install the filter sold separately.**

To install a filter sold separately, be sure to set the fan referring the following description.
* The filter sold separately cannot be installed to an air conditioner built in with auxiliary electric heater.

Setup of fan when building in the filter sold separately:

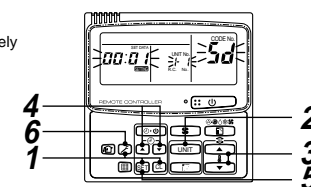
Necessary at initial installation only

Two methods are provided for setup, one is to use a wired remote controller sold separately and the other is to exchange the short plug on the indoor microcomputer P.C. board.

[Using a wired remote controller sold separately]

(Procedure) Perform the setup while the equipment stops.

- Push + + concurrently for 4 seconds or more.**
The firstly displayed unit No. is the master indoor unit address of the group control.
In this time, the fan of the selected indoor unit only operates.
- Every pushing button, No. of the group control units are displayed in order.**
In this time, the fan of the selected indoor unit only operates.
- Using set temperature and , specify the item code "5d".**
- Using timer time and , select from the set data.**
For contents of the setup data, refer to the table at the right.
- Push button.**
(When flashing display changes to lighting display, the setup completes.)
- Pushing button returns the state to the normal stop state.**



* Setup can be performed only by the wired remote controller. If setup is not performed, air volume is decreased and dewing occurs.

Item code 5d

Set data	Filter sold separately
0000	Standard filter (At shipment)
0001	High-efficiency filter (65%) (TCB-UFM11BE to UFM41BE) High-efficiency filter (90%) (TCB-UFH51BE to UFH81BE)

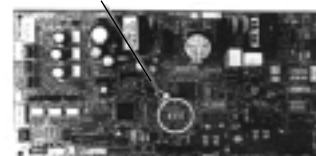
[Exchange of short plug on indoor microcomputer P.C. board]

To exchange the static pressure, there is a method other than the abovementioned method by wired remote controller, which is to shift the short plug on the indoor microcomputer P.C. board as shown in the following table. Adopt this method in case of using a wireless remote controller, etc.

* However, after exchanging once, be careful to shift the short plug to the standard position (At shipment) in order to return to the standard setup (follow to E2PROM setup) though the setup for high static-pressure 1, high static-pressure 2, or low static-pressure can be arbitrarily performed. It is necessary to rewrite data from the wired remote controller sold separately in the set data "0000".

- Select with shifting of the short plug on the indoor unit microcomputer P.C. board.

Short plug position (CN112, CN111, CN110 from the left)



*1 Resistance of high-efficiency filter 65 and 90, deodorant filter, or ammonium filter is equivalent to 30Pa. Therefore, set the resistance (external static pressure) of a duct to be connected to 40Pa.

Short plug position	External static pressure	Filter sold separately
	40Pa	Standard filter (At shipment) Zeolite-3G deodorant filter
	70Pa	*1 High-efficiency filter 65 High-efficiency filter 90 Deodorant filter Ammonium filter
	100Pa	—
	20Pa	—

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